MARKET ANALYSIS SERVICE

1979 ANNUAL REPORT

INPUT
LIBRARY

ABOUT INPUT

THE COMPANY

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through technology forecasting analysis, INPUT support in making informed de services are provided t of computers, commur products and services.

The company carries o depth research. W clients on important members analyze and i data, then develop r innovative ideas to Clients receive rep access to data on whic and continuous consulti

Many of INPUT's profe have nearly 20 years areas of specializatio senior management pc marketing, or planni enables INPUT to supp to complex business pr

Formed in 1974, IN leading international consulting firm. Clients include over 100 of the world's largest and most technically advanced companies.

M
1979
AN9
c.1
Walter Smith
AUTHOR
Market Analysis Service
1979 Annual Report 12/79

UNITED STATES, West Coast
2471 East Bayshore Road
Suite 600
Palo Alto, California 94303
(415) 493-1600

st Coast

rsey 07662

oor)

e Company, Ltd.
. 12-7 Kita Aoyama

AUSTRALIA
Infocom Australia
Highland Centre, 7-9 Merriwa Street
P.O. Box 110, Gordon N.S.W. 2072
(02) 498-8199
Telex AA 24434

000031

MARKET ANALYSIS SERVICE

1979 ANNUAL REPORT

INPUT LIBRARY

DECEMBER 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

Digitized by the Internet Archive
in 2015

https://archive.org/details/marketanalysisse09unse

MARKET ANALYSIS SERVICE
1979 ANNUAL REPORT

TABLE OF CONTENTS

		Page
I	INTRODUCTION	1
II	EXECUTIVE SUMMARY	5
	A. Computer Services Market Size And Growth	5
	B. Issues Affecting Computer Services Markets	10
	C. IBM And Computer Services	14
	D. Recommendations	17
III	MARKET ANALYSIS, 1979-1984	21
	A. Overall Computer Services Market Changes	21
	B. General Business Processing Services	26
	C. Scientific And Engineering Processing Services	29
	D. Industry Specialty Processing Services	31
	E. Utility Processing Services Market	34
	F. Facilities Management Market	37
	G. Software Products Markets	38
	1. Systems Software Markets	41
	2. Applications Software Markets	43
	H. Professional Services Markets	46
	I. Turnkey System Markets	48
	J. Vendor Activity Across Industry Sectors	49
	1. User Site Hardware Services (USHS)	49
	2. Data Base Management Systems (DBMS)	50
	3. Disaster Recovery	51
	4. Acquisitions	51
	5. Distributed Data Processing (DDP)	53
	6. Small Business Computers	54
	7. Word Processing	55
	8. Other Products And Services	56
IV	DISCRETE MANUFACTURING INDUSTRY SECTOR MARKETS	59
	A. Industry Characteristics	59
	B. Computer Services Market Forecasts, 1979-1984	62
	C. EDP Usage	65
	D. Vendor Activities	65
V	PROCESS MANUFACTURING INDUSTRY SECTOR MARKETS	71
	A. Industry Characteristics	71
	B. Computer Services Market Forecasts, 1979-1984	74
	C. EDP Usage	76
	D. Vendor Activities	78

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

		Page
VI	TRANSPORTATION INDUSTRY SECTOR MARKETS	79
	A. Industry Characteristics	79
	B. Computer Services Market Forecasts, 1979-1984	81
	C. EDP Usage	83
	D. Vendor Activities	83
VII	UTILITIES INDUSTRY SECTOR MARKETS	87
	A. Industry Characteristics	87
	B. Computer Services Market Forecasts, 1979-1984	90
	C. EDP Usage	92
	D. Vendor Activities	92
VIII	BANKING AND FINANCE INDUSTRY SECTOR MARKETS	97
	A. Industry Characteristics	97
	B. Computer Services Market Forecasts, 1979-1984	105
	C. EDP Usage	107
	D. Vendor Activities	109
	1. Acquisitions	109
	2. Industry Specialty	112
	3. Financial Services	113
	4. Credit/Debit Cards	114
	5. Electronic Funds Transfer/Automated Teller Machine (EFTS/ATM)	115
IX	INSURANCE INDUSTRY SECTOR MARKETS	117
	A. Industry Characteristics	117
	B. Computer Services Market Forecasts, 1979-1984	121
	C. EDP Usage	124
	D. Vendor Activities	126
X	MEDICAL INDUSTRY SECTOR MARKETS	129
	A. Industry Characteristics	129
	B. Computer Services Market Forecasts, 1979-1984	133
	C. Characteristics Of In-House EDP Organizations	135
	D. Vendor Activities	135
XI	EDUCATION INDUSTRY SECTOR MARKETS	139
	A. Industry Characteristics	139
	B. Computer Services Market Forecasts, 1979-1984	141
	C. EDP Usage	141
	D. Vendor Activities	143
XII	RETAIL INDUSTRY SECTOR MARKETS	147
	A. Industry Characteristics	147
	B. Computer Services Market Forecasts, 1979-1984	150
	C. EDP Usage	153
	D. Vendor Activities	153

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

		Page
XIII	WHOLESALE INDUSTRY SECTOR MARKETS	157
	A. Industry Characteristics	157
	B. Computer Services Market Forecasts, 1979-1984	157
	C. EDP Usage	163
	D. Vendor Activities	165
XIV	FEDERAL GOVERNMENT SECTOR MARKETS	171
	A. Industry Characteristics	171
	B. Computer Services Market Forecasts, 1979-1984	173
	C. Characteristics Of In-House EDP Organizations	175
	D. Vendor Activities	175
XV	STATE AND LOCAL GOVERNMENT SECTOR MARKETS	179
	A. Industry Characteristics	179
	B. Computer Services Market Forecasts, 1979-1984	179
	C. EDP Usage	182
	D. Vendor Activities	183
XVI	SERVICES INDUSTRY SECTOR MARKETS	185
	A. Industry Characteristics	185
	B. Computer Services Market Forecasts, 1979-1984	187
	C. EDP Usage	189
	D. Vendor Activities	189
XVII	OTHER INDUSTRIES SECTOR MARKETS	193
	A. Industry Characteristics	193
	B. Computer Services Market Forecasts, 1979-1984	196
	C. EDP Usage	196
	D. Vendor Activities	198
APPENDIX A:	DEFINITIONS	203
APPENDIX B:	CURRENT STATUS OF IN-HOUSE EDP IN MAJOR COMPANIES AND INSTITUTIONS	213
	A. Description Of INPUT's User Panel	213
	B. Objectives, Applications Plans, Expenditure Patterns	213
	C. Use Of Hardware By EDP Managers	236
	D. EDP Managers' Current And Anticipated Involvement In Office Automation	238
APPENDIX C:	RECONCILIATION OF MARKET FORECAST DIFFERENCES, 1978/1979	241
	A. Overall Market	241
	B. Discrete Manufacturing	243
	C. Process Manufacturing	245
	D. Transportation	247
	E. Utilities	247
	F. Banking And Finance	249
	G. Insurance	252
	H. Medical	254

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

		Page
	I. Education	254
	J. Retail	257
	K. Wholesale	257
	L. Federal Government	260
	M. State And Local Government	260
	N. Services	263
	O. Other	263
APPENDIX D:	TOTAL PROCESSING SERVICES MARKETS BY MODE OF DELIVERY	267
APPENDIX E:	RESPONDENT HARDWARE INSTALLED AND ON ORDER	283
APPENDIX F:	RELATED INPUT REPORTS	295
APPENDIX G:	USER PANEL RESPONDENT PROFILE AND QUESTIONNAIRE	299

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

MARKET ANALYSIS SERVICE
1979 ANNUAL REPORT

LIST OF EXHIBITS

			Page
II	-1	Incremental Revenue Growth By Mode And Type Of Service, 1979-1984	7
	-2	Incremental Revenue Growth By Industry Sector, 1979-1984	8
	-3	Computer Services Market Forecast, 1979-1984	9
	-4	IBM's Future, Current, And Projected Priorities For Computer Products	16
III	-1	Computer Services Market - Forecast By Mode And Type Of Service - Total, 1979-1984	22
	-2	Computer Services Market - Forecast By Industry Sector, 1979-1984	24
	-3	Impact Of Inflation On Computer Services Growth, 1979-1984	25
	-4	General Business Processing Services - Market Forecast By Industry Sector, 1979-1984	27
	-5	Scientific And Engineering Processing Services - Market Forecast By Industry Sector, 1979-1984	30
	-6	Industry Specialty Processing Services - Market Forecast By Industry Sector, 1979-1984	32
	-7	Utility Processing Services - Market Forecast By Industry Sector, 1979-1984	36
	-8	Facilities Management Services By Industry Sector	39
	-9	Software Products - Total Market Forecast By Industry Sector, 1979-1984	40
	-10	Systems Software Packages - Market Forecast By Industry Sector, 1979-1984	42
	-11	Applications Software Packages - Market Forecast By industry Sector, 1979-1984	44
	-12	Applications Software Products Available In The U.S.	45
	-13	Professional Services - Total Market Forecast By Industry Sector, 1979-1984	47
IV	-1	Discrete Manufacturing Industry Sector - Demographic Data	60
	-2	Computer Services Market Forecast - Discrete Manufacturing Sector, 1979-1984	63
	-3	Average Expenditures For Services And Software In The Discrete Manufacturing Sector	66

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

			Page
V	-1	Process Manufacturing Industry Sector - Demographic Data	72
	-2	Computer Services Market Forecast - Process Manufacturing Sector, 1979-1984	75
	-3	Average Expenditures For Services And Software In The Process Manufacturing Sector	77
VI	-1	Transportation Industry Sector - Demographic Data	80
	-2	Computer Services Market Forecast - Transportation Sector, 1979-1984	82
	-3	Average Expenditures For Services And Software In The Transportation Sector	84
VII	-1	Utilities Industry Sector - Demographic Data	88
	-2	Computer Services Market Forecast - Utilities Sector, 1979-1984	91
	-3	Average Expenditures For Services And Software In The Utility Sector	93
VIII	-1	Banking And Finance Industry Sector - Demographic Data	98
	-2	Standard Industrial Classification (SIC) Industries Included In Banking And Finance Subsectors	101
	-3	Computer Services Market Forecast For Banking And Finance By Industry Subsector, 1978-1984	106
	-4	Computer Services Market Forecast - Banking And Finance Sector, 1979-1984	108
	-5	Average Expenditures For Services And Software In The Banking And Finance Sector	110
IX	-1	Insurance Industry Sector - Demographic Data	118
	-2	Standard Industrial Classification (SIC) Industries Included In Insurance Subsectors	120
	-3	Computer Services Market Forecast For Insurance Sector By Industry Subsector	122
	-4	Computer Services Market Forecast - Insurance Sector, 1979-1984	123
	-5	Average Expenditures For Services And Software In The Insurance Sector As Reported By Respondents	125
X	-1	Medical Industry Sector - Demographic Data	130
	-2	Computer Services Market Forecast - Medical Sector, 1979-1984	134
XI	-1	Education Industry Sector - Demographic Data	140
	-2	Computer Services Market Forecast - Education Sector, 1979-1984	142
XII	-1	Retail Industry Sector - Demographic Data	148
	-2	Retail Organizations - Distribution By Size, 1976	149
	-3	Computer Services Market Forecast - Retail Sector, 1979-1984	151
	-4	Average Expenditures For Services And Software In The Retail Sector	154

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

			Page
XIII	-1	Wholesale Industry Sector - Demographic Data	158
	-2	Computer Services Market Forecast - Wholesale Sector, 1979-1984	161
	-3	Average Expenditures For Services And Software In The Wholesale Sector	164
XIV	-1	Computer Services Market Forecast - Federal Government Sector, 1979-1984	174
XV	-1	State And Local Government - Demographic Data	180
	-2	Computer Services Market Forecast - State And Local Government Sector, 1979-1984	181
XVI	-1	Services Industry Sector - Demographic Data	186
	-2	Computer Services Market Forecast - Services Industry Sector, 1979-1984	188
XVII	-1	Other Industries Sector - Demographic Data	194
	-2	Computer Services Market Forecast - Other Industries Sector, 1979-1984	197
	-3	Average Expenditures For Services And Software In The Education, Medical, Services, And Other Industries Sector	199
A	-1	Industry Sector Definitions	209
B	-1	1979 EDP Objectives Average For All Industry Sectors	214
	-2	Development Of New Applications And On-Line Applications As Percentage Of Total EDP Objectives	216
	-3	Respondent Involvement In Distributed Data Processing	217
	-4	Applications To Be Developed By Respondents	219
	-5	Applications Given Highest Priority	221
	-6	Respondents Looking For Applications Software	222
	-7	Most Popular Methods For Improving Time And Cost Of Application Development	223
	-8	Most Significant EDP Problems In 1979	224
	-9	EDP Resource Utilization	227
	-10	Anticipated Changes In EDP Budgets For Respondents In All Industries	229
	-11	Outside Services Purchased By Non-EDP Departments In 1978	230
	-12	EDP Managers' Estimates Of Average Expenditures For Services And Software For All Industries	232
	-13	Number Of EDP Employees Per 100 Company Employees As Reported By Respondents	233
	-14	EDP Budget Dollars Per EDP Employee As Reported By Respondents	234
	-15	Average EDP Budget As Reported By Respondents	235
	-16	Minicomputer And Microcomputer Installations By Respondents	237
	-17	Percent Of Respondents Currently Using Systems And Programs Related To The Office Of The Future	239

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

			Page
C	-1	Reconciliation Of Computer Services Forecasts By Industry Sector Between 1978 And 1979 Annual Reports	242
	-2	Reconciliation Of Computer Services Forecasts In Discrete Manufacturing Between 1978 And 1979 Annual Reports	244
	-3	Reconciliation Of Computer Services Forecasts In Process Manufacturing Between 1978 And 1979 Annual Reports	246
	-4	Reconciliation Of Computer Services Forecasts In Transportation Between 1978 And 1979 Annual Reports	248
	-5	Reconciliation Of Computer Services Forecasts In Utilities Between 1978 And 1979 Annual Reports	250
	-6	Reconciliation Of Computer Services Forecasts In Banking And Finance Between 1978 And 1979 Annual Reports	251
	-7	Reconciliation Of Computer Services Forecasts In Insurance Between 1978 And 1979 Annual Reports	253
	-8	Reconciliation Of Computer Services Forecasts In Medical Between 1978 And 1979 Annual Reports	255
	-9	Reconciliation Of Computer Services Forecasts In Education Between 1978 And 1979 Annual Reports	256
	-10	Reconciliation Of Computer Services Forecasts In Retail Between 1978 And 1979 Annual Reports	258
	-11	Reconciliation Of Computer Services Forecasts In Wholesale Between 1978 And 1979 Annual Reports	259
	-12	Reconciliation Of Computer Services Forecasts In Federal Government Between 1978 And 1979 Annual Reports	261
	-13	Reconciliation Of Computer Services Forecasts In State And Local Government Between 1978 And 1979 Annual Reports	262
	-14	Reconciliation Of Computer Services Forecasts In Services Between 1978 And 1979 Annual Reports	264
	-15	Reconciliation Of Computer Services Forecasts In Other Industry Between 1978 And 1979 Annual Reports	265
D	-1	Remote Computing Services - Total Market Forecast By Industry Sector, 1979-1984	268
	-2	Remote Computing Services - General Business Forecast By Industry Sector, 1979-1984	269
	-3	Remote Computing Services - Scientific And Engineering Forecast By Industry Sector, 1979-1984	270
	-4	Remote Computing Services - Industry Specialty Forecast By Industry Sector, 1979-1984	271
	-5	Remote Computing Services - Utility Forecast By Industry Sector, 1979-1984	272
	-6	Facilities Management - Total Market Forecast By Industry Sector, 1979-1984	274
	-7	Facilities Management - Scientific And Engineering Forecast By Industry Sector, 1979-1984	275
	-8	Facilities Management - Industry Specialty Forecast By Industry Sector, 1979-1984	276
	-9	Facilities Management - Utility Forecast By Industry Sector, 1979-1984	277

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

			Page
	-10	Batch Services - Total Market Forecast By Industry Sector, 1979-1984	278
	-11	Batch Services - General Business Forecast By Industry Sector, 1979-1984	279
	-12	Batch Services - Scientific And Engineering Forecast By Industry Sector, 1979-1984	280
	-13	Batch Services - Industry Specialty Forecast By Industry Sector, 1979-1984	281
	-14	Batch Services - Utility Forecast By Industry Sector, 1979-1984	282
E	-1	Hardware Installed And On Order In The Discrete Manufacturing Sector	284
	-2	Hardware Installed And On Order In The Process Manufacturing Sector	285
	-3	Hardware Installed And On Order In The Transportation Sector	286
	-4	Hardware Installed And On Order In The Utility Sector	287
	-5	Hardware Installed And On Order In The Banking And Finance Sector	288
	-6	Hardware Installed And On Order In The Insurance Sector	289
	-7	Hardware Installed And On Order In The Retail Sector	290
	-8	Hardware Installed And On Order In The Wholesale Sector	291
	-9	Hardware Installed And On Order In The Education, Medical, Services, And Other Industries Sector	292
	-10	Mainframe Hardware Installed By Respondents	293
	-11	Mainframe Hardware On Order By Respondents	294

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

1 INTRODUCTION

I INTRODUCTION

- This report is produced by INPUT as part of the Market Analysis Service (MAS).

- The purpose of the report is to present forecasts and analyses of markets and developments in the computer services industry.

  - These characteristics are described qualitatively, and their impact is reflected by computer services market size forecasts through 1984.

  - Because of the increasing integration of hardware and services, the coverage of hardware issues has been greatly expanded. A separate forecast for turnkey systems has been added this year.

- The base year for forecasting is 1978.

- This report provides information on each type of computer services category covered:

  - Processing Services

    . General business.

    . Scientific and engineering.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

    - . Industry specialty.
    - . Utility.
  - Software Products
    - . Systems software.
    - . Applications software.
  - Professional Services
- It also addresses the mode of delivery of processing services:
  - Remote Computing Services.
  - Batch Processing Services.
  - Facilities Management.
- Types and modes of services are forecast both separately and combined for each industry sector, in response to client requests for such forecasts.
- Analysis and forecasts are presented on each of the following major industry sectors:

Discrete Manufacturing	Education
Process Manufacturing	Retail
Transportation	Wholesale
Utilities	Federal Government
Banking and Finance	State and Local Government
Insurance	Services
Medical	Other Industries

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

This information is of a summary nature; more detailed information is provided through the INPUT Industry Reports which are referenced in the text where appropriate.

- This Annual Report provides updates on information published in previous Annual Reports and other INPUT reports. A listing of these reports appears in Appendix F.

- The data on which this report is based come from:

  - Information from over 3,500 personal and telephone interviews INPUT staff have carried out during the past year with computer and computer services users.

  - Continuous interchange with vendors during the past year, including over 500 formal interviews and 1,000 direct contacts.

- Results from a detailed questionnaire completed by 440 EDP managers on INPUT's User Panel are included.

- The results presented in this report derive from an analysis and interpretation of these data, based on the experience and expertise of INPUT staff.

- Inquiries and comments from clients on the information presented are requested. Suggestions for changes in the structure or contents of this report are welcomed.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. COMPUTER SERVICES MARKET SIZE AND GROWTH

- The computer services industry ended the 1970s with 1979 U.S. annual revenues which will total $10.1 billion, a growth of 17% over 1978.

  - These figures include IBM software and services revenues which totalled $0.6 billion.

  - Excluded are captive U.S. revenues of approximately $0.4 billion and international revenues of U.S. companies of $0.5 billion. Inclusion of these revenues yields a 1979 industry total of $11 billion.

  - Many revenue components of the industry are growing at greater than the industry rate, and these represent potential opportunities. Exhibit II-1 shows the incremental growth available to industry participants by mode of delivery and type of service.

  - Within the processing services category, industry specialty services delivered as remote computing are by far the largest contributor to growth, comprising almost 40% of the total. This points up the continued importance of industry specialty; if industry specialty, delivered via FM, is added to RCS, they make up over half of the incremental growth.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The most dramatic growth is in software, particularly systems software; this growth will be shared with hardware vendors marketing software.

- Exhibit II-2 is based on computer services revenues derived from user industry sectors. Opportunities in these sectors vary, not only by size, but by other factors unique to each sector.

  - Discrete manufacturing has the largest potential, surpassing banking and finance. Banking and finance currently is a larger contributor of computer services revenues, but is the more mature market segment.

  - Each sector is discussed in greater detail in individual chapters of this report; Exhibits II-1 and II-2 put in perspective the importance of industry specialization, and show the wide differences in the overall potential per sector.

- Exhibit II-3 contains a summary of the detailed forecasts contained in later chapters of this report.

  - Factors which will feed continued market growth include:

    . Further software unbundling by IBM and other hardware vendors.

    . Continued shortage of skilled in-house EDP personnel leading to user pressure to use outside services to implement new applications.

    . Increased government regulation requiring more standardized reporting.

  - Factors which limit this market growth include:

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT II-1

INCREMENTAL REVENUE GROWTH BY

MODE AND TYPE OF SERVICE, 1979-1984

COMPUTER SERVICE BY MODE AND TYPE*	AAGR 1979-1984 (PERCENT)	INCREMENTAL REVENUE GROWTH IN CURRENT DOLLARS ($ MILLION)
INDUSTRY SPECIALTY - RCS	22%	$2,800
UTILITY - RCS	20	1,100
INDUSTRY SPECIALTY - FM	15	1,000
GENERAL BUSINESS - RCS	20	700
GENERAL BUSINESS - BATCH	13	600
INDUSTRY SPECIALTY - BATCH	8	500
SCIENTIFIC & ENGINEERING - RCS	16	400
UTILITY - FM	16	300
SCIENTIFIC & ENGINEERING - FM	8	50
UTILITY - BATCH	2	50
SCIENTIFIC & ENGINEERING - BATCH	0	0
GENERAL BUSINESS - FM	0	0
TOTAL PROCESSING	16%	$7,400
SYSTEMS SOFTWARE	32%	$3,000
APPLICATIONS SOFTWARE	24	1,400
TOTAL SOFTWARE	29%	$4,400
PROFESSIONAL SERVICES	19%	$2,200

$0 1,000 2,000 3,000

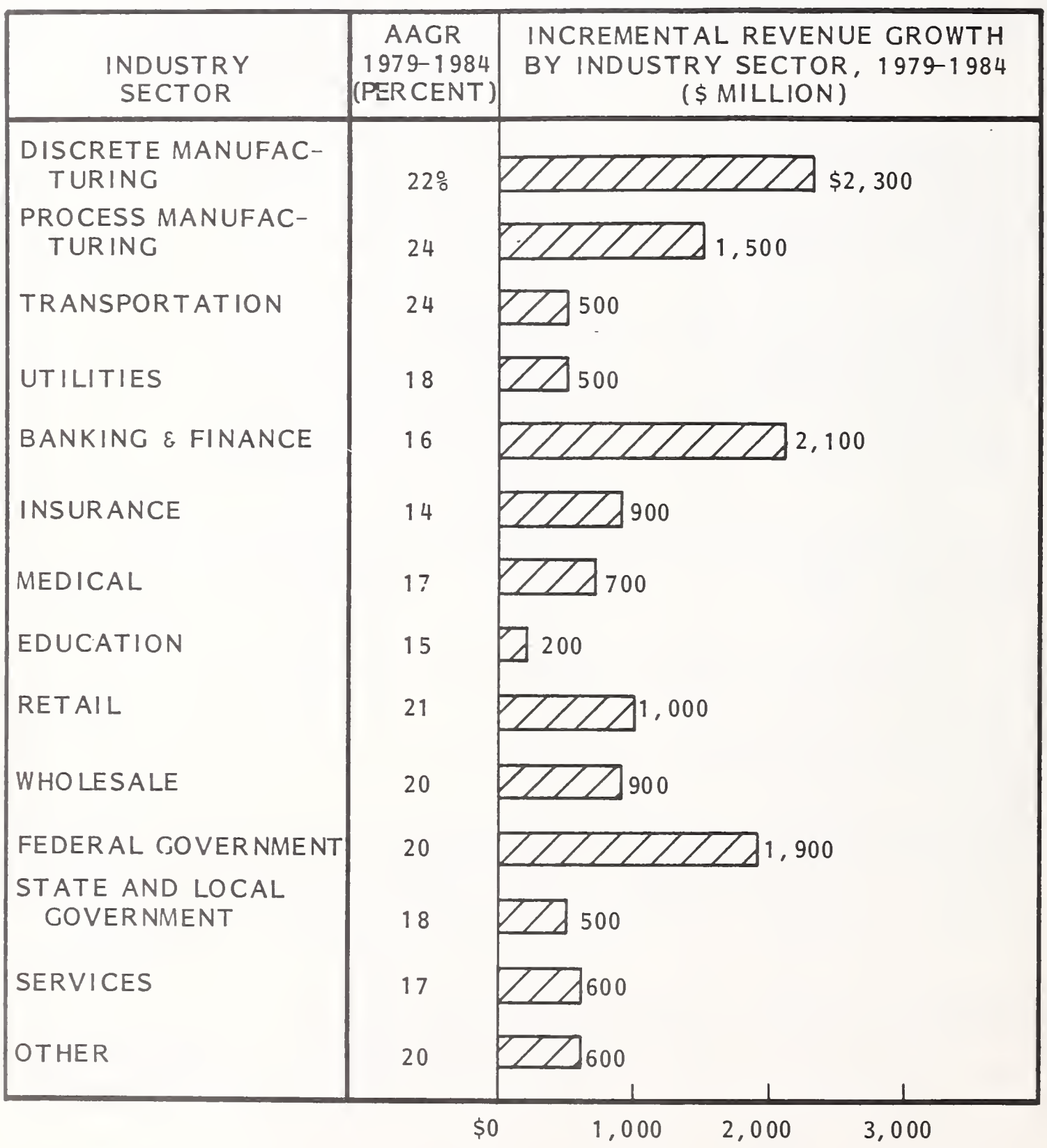
* RCS = REMOTE COMPUTING SERVICE
FM = FACILITIES MANAGEMENT
AAGR = AVERAGE ANNUAL GROWTH RATE

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT II-2

INCREMENTAL REVENUE GROWTH BY
INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	AAGR 1979-1984 (PERCENT)	INCREMENTAL REVENUE GROWTH BY INDUSTRY SECTOR, 1979-1984 ($ MILLION)
DISCRETE MANUFACTURING	22%	$2,300
PROCESS MANUFACTURING	24	1,500
TRANSPORTATION	24	500
UTILITIES	18	500
BANKING & FINANCE	16	2,100
INSURANCE	14	900
MEDICAL	17	700
EDUCATION	15	200
RETAIL	21	1,000
WHOLESALE	20	900
FEDERAL GOVERNMENT	20	1,900
STATE AND LOCAL GOVERNMENT	18	500
SERVICES	17	600
OTHER	20	600



© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT II-3

COMPUTER SERVICES MARKET FORECAST,
1979-1984

MODE OF DELIVERY	1978 ($MILLION)	1979 ($MILLION)	GROWTH 1978-1979 (PERCENT)	1984 ($MILLION)	AAGR 1979-1984 (PERCENT)
REMOTE COMPUTING	$ 2,650	$ 3,190	20%	$ 8,200	21%
FACILITIES MANAGEMENT	1,150	1,320	15	2,600	15
BATCH	2,190	2,370	9	3,500	8
SUB TOTAL-PROCESSING	5,990	6,880	15	14,300	16
SOFTWARE PRODUCTS	1,350	1,700	26	6,100	29
PROFESSIONAL SERVICES	1,370	1,620	18	3,800	19
TOTAL	$ 8,710	$10,200	17%	$24,200	19%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- A shortage of skilled personnel in services companies, leading to delays in product development and high turnover.

- Conversion of some applications to in-house, partly due to the lower cost of hardware.

- Price competition between vendors, particularly in mature markets.

- Confusion among both vendors and users concerning new hardware options, office of the future, and communications alternatives which will lead to delays in decision making.

B. ISSUES AFFECTING COMPUTER SERVICES MARKETS

- The traditional areas of computer hardware, telecommunications, software, and services are increasingly overlapping. Also, there is continuing rapid improvement in the price/performance of computers.

- Some larger computer services companies have responded to this development by offering combinations of user site hardware, substantial software, access to a network, and access to the vendor's central computer - ADP's "On-Site" is an example.

  - User awareness of these offerings is still limited.

  - The potential for these offerings lies in their ability to offer "instant distributed processing."

  - The market of these offerings in 1980, termed "User Site Hardware Services" is $400 million. This forecast is in the process of being updated.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Computer services companies of all sizes have responded by offering turnkey systems - combinations of hardware and software to be used in essentially standalone environments.

  - Companies offering specialized applications are meeting with some success.

  - Companies offering generalized accounting packages on minicomputers are meeting strong competition from hardware vendors selling direct and from computer services companies selling processing services and software.

  - Although the trend is for more turnkey offerings from computer services companies, almost half of the computer services companies have resisted these offerings to date, reflecting a "wait and see attitude"; as hardware costs continue to drop these companies must continually evaluate their position.

  - Over 60,000 turnkey systems were shipped by all types of vendors in 1979. This equals over $4 billion in revenues for hardware, software, and related services.

  - Computer services companies should pay particular attention to the issue of user training; new techniques, such as computer assisted instruction, must be developed to accomplish the task of training a new user population.

- The high rate of inflation has had, and will continue to have, an impact:

  - In 1978-1979 the proportion of growth due to inflation approximated 7% for processing services, 12% for software products, and 14% for professional services.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- This impact of inflation reflects the relative expenditure for personnel versus equipment, with professional services companies having the highest personnel cost.

- The impact of personnel costs and the shortage of skilled personnel means there is a continued need to find ways to improve productivity in order to sustain growth.

  - Personnel costs, as a percent of EDP budgets, actually increased last year after a long period of decline.

  - Services companies can capitalize on this if they can more efficiently use their human resources.

- In the 1980s, telecommunications will continue to increase in importance.

  - Not only is the number of terminal installations increasing rapidly, but terminal types are changing, moving towards display systems, and the degree of use of all terminals is increasing.

  - IBM, with System Network Architecture (SNA), has a "philosophy" of network construction, but the user still has to implement SNA by itself, an expensive process with major ramifications in terms of potential future expansion.

  - AT&T, with Advanced Communications Services (ACS), is making a major investment in network development. However, the much advertised "software" problems that are delaying ACS's availability may be hiding some fundamental business problems related to the life cycle of a "data only" network such as ACS; its pricing, and its importance in the overall mix of AT&T's problems and opportunities.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The issue of regulation is still unclear. Tymnet is the only regulated Value Added Network (VAN) currently offered by a computer services company (Tymshare).

- Xerox, with X-TEN, is directing a VAN at the office of the future market.

- Communications software and software to support distributed data bases are still far from totally satisfactory and are limiting factors today in the implementation of networks and distributed data processing.

- The merging of text and graphics, though much discussed, is not a widespread occurrence.

  - Only one quarter of over 400 EDP managers responding to INPUT's User Panel expect to ever be responsible for word processing. EDP managers feel they have more than enough to handle in meeting demands for advanced data processing applications, without involving themselves in text/graphics applications.

  - Vendors of word processing equipment, including IBM, have generally not yet mounted a marketing effort aimed at combining text markets (primarily the domain of the office manager) and data markets (primarily the domain of the EDP manager). Wang and, more recently, Xerox are vendors that are doing so.

  - To the extent that word processing and related applications are becoming part of a communications environment, an opportunity does exist for services companies. To date, however, the market for information processing services based on the "office of the future" concept is small (approximately $40 million in 1979) but is growing fairly rapidly -50% per year in 1979-1984.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The advent of very small computers is changing the options open to some computer services users. Radio Shack has sold over 100,000 small computers in the past two years. In the 1980s, these small computers will also invade large corporations, providing opportunities and problems for in-house EDP managers as well as for vendors of outside services.

C. IBM AND COMPUTER SERVICES

- IBM's continued unbundling of software is enabling it to gain an increasing share of the software products segment of the computer services industry.

  - The cost of systems software on an IBM Series 8100 is between 16% and 27% of the hardware price, and between 8% and 10% on a Series 4300. These figures compare to less than 5% on earlier systems.

  - This trend will continue as IBM looks to software revenues as one means of offsetting the declining price of hardware.

- IBM will continue to emphasize hardware based offerings as a prime thrust in maintaining account control, but is free to add processing services now that its 1973 agreement with CDC has expired.

  - INPUT forecasts that IBM will offer processing services in the U.S. in the 1980s on a selective basis.

  - These offerings will tend to be industry specialized, and will often include installation of processors at user sites.

  - IBM may also offer services in the Federal Government sector as a means of combatting constraints on in-house systems.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- An example of the type of offering envisioned is IBM's recent announcement of a new timesharing service in Canada.

  - Designated "BASE", this service is aimed at security brokers needing access to both local data and remote data bases.

  - The user site hardware is the IBM 8100 distributed processing system; it communicates with IBM mainframes at an IBM data center.

  - Pricing for the service includes charges for installation, charges for communications, for line access, for inquiries, for updates and transfers, plus a fixed fee per year for the BASE software. Clearly the offering is unbundled.

- The 4300 also gives IBM a product with a price/performance that will be attractive to current buyers of outside services.

  - NCSS responded promptly to the 4300 announcement by revising pricing and configurations of their 3200 offering.

  - Other vendors contemplating offerings of hardware combined with services must consider the impact of the 4300.

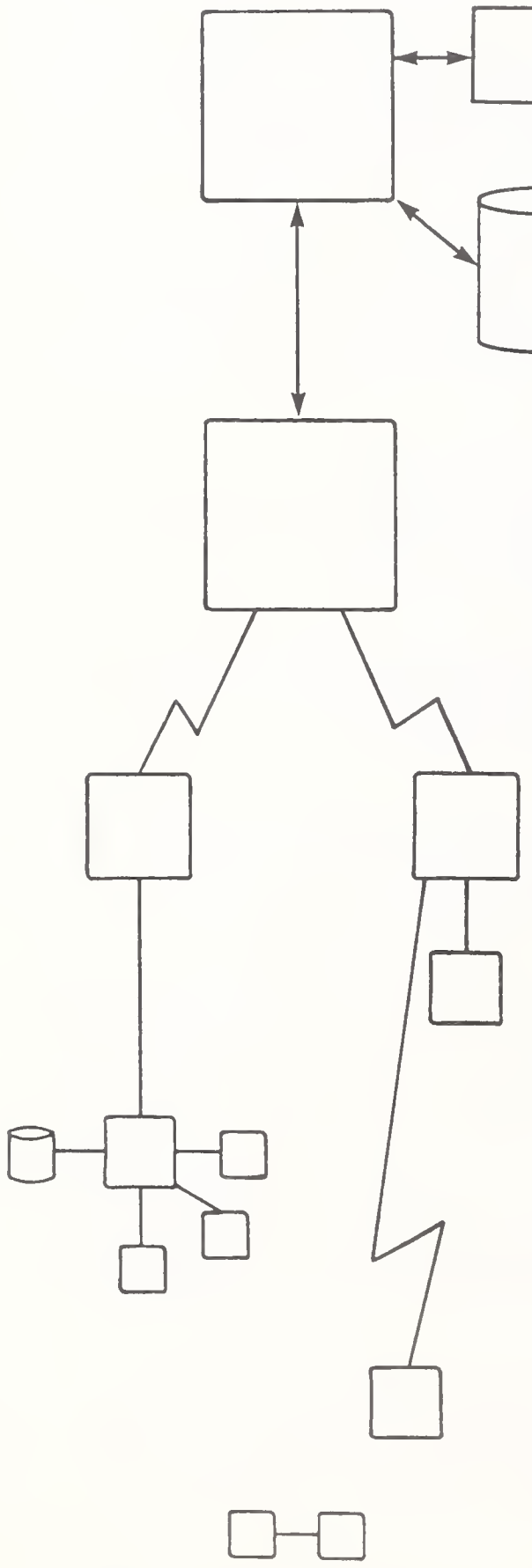
  - INPUT has received some reports of IBM salesmen marketing the 4300 to individual user groups within large companies, instead of coordinating the sale through the central EDP establishment. Should this technique become widespread it will impact computer services companies and minicomputer companies who have traditionally sold to these user groups, as well as raise problems of account control within IBM.

- IBM can be expected to emphasize software in the near term, with a shift to storage and office automation in the mid 1980s, as shown in Exhibit II-4.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT II-4

IBM'S FUTURE, CURRENT, AND PROJECTED PRIORITIES
FOR COMPUTER PRODUCTS



PRODUCT	PRIORITY	
	CURRENT	1985
SECONDARY STORAGE & MEMORY	(3)	(1)
OPERATING SYSTEMS, DBMS, COMMUNICATIONS SOFTWARE, DDP	(1)	(6)
MINICOMPUTERS, TERMINALS, REMOTE SOFTWARE	(2)	(4)
WORD PROCESSING, TEXT PROCESSING, ELECTRONIC OFFICE,	(3)	(1)
REMOTE COMPUTING SERVICES	(5)	(5)
MICROCOMPUTERS	(6)	(3)

NOTE: THE SOURCE OF THIS CHART IS A RANGE OF VENDOR AND USER INTERVIEWS COMBINED WITH AN ANALYSIS DONE BY INPUT STAFF CONCERNING THE RANKING OF PRIORITIES BY IBM

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Computer services as a standalone business will not have a high priority during the forecast period.

- Much of IBM's thrust in software and hardware will be directed at information base handling.

D. RECOMMENDATIONS

- Processing services companies must react to the combination of services, hardware, and communications by unbundling pricing.

  - This will present the user with better comparisons vis-a-vis in-house alternatives.

  - Each area, and particularly maintenance, can be treated as a profit generator.

- The use of acquisitions as a means of achieving growth continues at a rapid pace.

  - Almost half of vendors surveyed had acquisition activity as part of their 1980 plan, up from one-third in 1979.

  - INPUT estimates that 100 acquisitions took place in the computer services industry in 1979.

  - Companies outside the industry are showing increased interest in the industry as evidenced by Dun and Bradstreet's acquisition of NCSS, McGraw Hill's acquisition of Data Resources, Inc., and H & R Block's acquisition of Compuserve.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- A computer services company's acquisition strategy should include the possibility of being acquired as well as acquiring other firms.

- Personnel recruiting, training, and retention are matters of prime importance.

  - The shortage of technical personnel is accelerating.

  - Salesman turnover of 30% and more is crippling some companies; the cost of an incidence of the loss of a single salesman exceeds $100,000 in many companies.

  - Management must treat its personnel as a prime resource.

- Computer services companies should view themselves as distribution channels and exploit their client base to deliver combinations of information, people, hardware and support, and other relevant products and services which may not necessarily be computer services.

  - The prevailing competitive edge of the services company is its expertise in user requirements.

  - This "expertise" will be increasingly specialized by industry and/or function.

- Services companies of all kinds can expect data base to be a key to success in the next decade. Companies must have a data base strategy which takes into account hardware, software, and communications development.

- Distributed data processing is being fed by cheaper hardware, new communications offerings, and a growing application backlog at the traditional in-house EDP installations. Services companies should have products and marketing strategies to exploit this situation - including a strategy for dealing with EDP managers.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Finally, services companies must increase their investment in research and development to exploit new opportunity areas, including those outside of data processing. There appears to be an increasing reluctance to take risks in many computer services companies. Yet it is their innovation and "risk taking" in new areas which has contributed so strongly to the growth of the industry.

  - In order to achieve and exceed the growth rates that INPUT forecasts for the 1980s, companies must continue to take well-calculated risks and investments which are proportionately as large as those they took in the 1970s.

  - The stakes in the 1980s for the computer services companies are much higher and so are the potential rewards. Vendors must remain aggressive to maintain or increase marketshare.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

III MARKET ANALYSIS, 1979-1984

III MARKET ANALYSIS, 1979-1984

A. OVERALL COMPUTER SERVICES MARKET CHANGES

- Computer services markets were evaluated, compared to prior INPUT reports, and forecast for the five-year period 1979-1984.
  - Market forecasts presented in Exhibit III-1 were built primarily on the forecasts contained in the 1978 Annual Report.
  - Adjustments to the 1978 base and forecasts were made based on 1979 research.
- The 1978 forecasts were derived from the "bottom up": individual forecasts were made by subsector and then grouped into 14 user industry sectors.
- An effort was made in the 1979 forecast to provide detailed categories for:
  - Processing services forecast, both by type of service (general business, scientific and engineering, industry specialty, and utility) and mode of service (remote computing, batch and facilities management).
  - Software products forecast, both by applications packages and systems packages.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-1

COMPUTER SERVICES-MARKET FORECAST BY MODE AND TYPE OF SERVICE - TOTAL, 1979-1984*

COMPUTER SERVICE		USER EXPENDITURES.								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 390	$ 480	21%	$ 580	$ 690	$ 840	$ 1,000	$ 1,190	20%
	SCI. & ENG.	300	340	13	390	460	540	630	730	16
	IND. SPEC.	1,320	1,610	22	1,980	2,410	2,950	3,610	4,410	22
	UTILITY	640	760	18	900	1,090	1,310	1,550	1,840	20
SUBTOTAL		2,650	3,190	20	3,850	4,650	5,640	6,790	8,170	21
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–	–	–	–
	SCI. & ENG.	100	110	6	120	130	140	150	160	8
	IND. SPEC.	840	960	15	1,110	1,270	1,470	1,680	1,920	15
	UTILITY	210	250	18	280	330	390	450	520	16
SUBTOTAL		1,150	1,320	15	1,510	1,730	2,000	2,280	2,600	15
BATCH	GEN. BUS.	690	750	9	840	950	1,060	1,200	1,360	13
	SCI. & ENG.	90	100	3	100	100	100	100	100	0
	IND. SPEC.	1,060	1,150	9	1,290	1,390	1,490	1,570	1,660	8
	UTILITY	350	370	7	380	390	400	400	410	2
SUBTOTAL		2,190	2,370	9	2,610	2,830	3,050	3,270	3,530	8
TOTAL PROCES-SING	GEN. BUS.	1,080	1,230	13	1,420	1,640	1,900	2,200	2,550	16
	SCI. & ENG.	490	550	10	610	690	780	880	990	13
	IND. SPEC.	3,220	3,720	16	4,380	5,070	5,910	6,860	7,990	16
	UTILITY	1,200	1,380	15	1,560	1,810	2,100	2,400	2,770	15
TOTAL		$ 5,990	$ 6,880	15%	$7,970	$9,210	$10,690	$12,340	$14,300	16%
SOFTWARE PRODUCTS	SYSTEM	$ 760	$ 980	29%	$1,280	$1,680	$ 2,210	$ 2,950	$ 3,950	32%
	APPLI-CATION	590	720	23	890	1,100	1,370	1,720	2,160	24
TOTAL		$ 1,350	$ 1,700	26%	$2,170	$2,780	$ 3,580	$ 4,670	$ 6,110	29%
PROFESSIONAL SERVICES		1,370	1,620	18	1,920	2,270	2,700	3,200	3,800	19
GRAND TOTAL		$ 8,710	$10,200	17%	$12,060	$14,260	$16,970	$20,210	$24,210	19%

* USER EXPENDITURES ARE ROUNDED TO NEAREST TEN MILLION DOLLARS

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Expanded coverage of in-house EDP activities as they relate to computer services.

- Vendor activity in each industry was studied to validate the base market and forecast numbers. The 1979 ADAPSO survey, which was performed by INPUT, was used as a further validation of key numbers. For example, the professional services detail was expanded partly based on the ADAPSO survey results.

- The year-by-year forecast by industry sector is presented in Exhibit III-2.

  - 1979, a good year, is expected to show a 17% growth over 1978.

  - The 1979-1984 growth rates are the average annual compounded rates.

  - The rates between individual years may differ, since the figures were built up from the more detailed forecasts which follow, and which take into account growth (and decline) in certain types and modes of service in each industry sector.

  - All figures are in current dollars. They include a 9% factor for inflation in 1979 and 1980, and a 7% factor between 1981 and 1984. The difference between the inflation rate and the annual increase in the Consumer Price Index (CPI) is assumed to be offset by technology. The impact of inflation on computer services expenditures is shown in Exhibit III-3.

    . Processing services will have a 7% inflation factor in 1979 and 1980, and a 5% factor between 1981 and 1984.

    . Software products will have a 12% inflation factor in 1979 and 1980, and a 10% factor between 1981 and 1984.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-2

COMPUTER SERVICES - MARKET FORECAST
BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$1,123	$1,337	19%	$1,635	$1,985	$2,410	$2,941	$3,595	22%
PROCESS MANUFACTURING	635	761	27	931	1,132	1,417	1,766	2,222	24
TRANSPORTATION	208	253	22	311	385	475	592	742	24
UTILITIES	336	396	18	468	545	644	764	913	18
BANKING AND FINANCE	1,644	1,907	16	2,208	2,557	2,957	3,425	3,969	16
INSURANCE	860	978	14	1,112	1,266	1,442	1,643	1,877	14
MEDICAL	495	570	15	648	756	887	1,049	1,245	17
EDUCATION	163	192	18	221	256	297	341	393	15
RETAIL	535	634	19	758	910	1,100	1,341	1,649	21
WHOLESALE	497	575	16	674	799	961	1,165	1,429	20
FEDERAL GOVERNMENT	1,087	1,279	19	1,520	1,825	2,184	2,618	3,132	20
STATE & LOCAL GOVERNMENT	325	378	16	447	537	638	753	880	18
SERVICES	420	498	18	605	702	814	937	1,082	17
OTHER	378	420	11	504	598	721	873	1,066	20
TOTAL	$8,697	$10,192	17%	$12,042	$14,253	$16,947	$20,208	$24,194	19%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-3
IMPACT OF INFLATION ON COMPUTER SERVICES GROWTH, 1979-1984

MODE	USER EXPENDITURES						AAGR 1979-1984 (PERCENT)
	1979 ($ MILLION)	1980 ($ MILLION)	1981 ($ MILLION)	1982 ($ MILLION)	1983 ($ MILLION)	1984 ($ MILLION)	
PROCESSING SERVICES							
TOTAL MARKET FORECAST	$ 6,880	$ 7,970	$ 9,210	$ 10,690	$12,340	$ 14,300	16%
GROWTH FROM INFLATION*	420	480	400	460	540	620	NA
REAL GROWTH*	470	610	840	1,020	1,110	1,340	NA
REAL GROWTH RATE*	8%	9%	12%	13%	12%	13%	11%
SOFTWARE PRODUCTS							
TOTAL MARKET FORECAST	1,700	2,170	2,780	3,580	4,670	6,110	29
GROWTH FROM INFLATION*	160	200	220	280	360	470	NA
REAL GROWTH*	190	270	390	520	730	970	NA
REAL GROWTH RATE*	14%	18%	22%	24%	27%	28%	22%
PROFESSIONAL SERVICES							
TOTAL MARKET FORECAST	1,620	1,920	2,270	2,700	3,200	3,800	19
GROWTH FROM INFLATION*	190	230	230	270	320	380	NA
REAL GROWTH*	60	70	120	160	180	220	NA
REAL GROWTH RATE*	4%	5%	8%	10%	10%	11%	8%
TOTAL COMPUTER SERVICES							
TOTAL MARKET FORECAST	$10,200	$12,060	$14,260	$ 16,970	$20,210	$ 24,210	19%
GROWTH FROM INFLATION*	770	910	850	1,010	1,220	1,470	NA
REAL GROWTH*	720	950	1,350	1,700	2,020	2,530	NA
REAL GROWTH RATE*	8%	10%	13%	14%	15%	16%	13%

* OVER PRECEEDING YEAR
N A = NOT APPLICABLE

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Professional services will have a 14% inflation factor in 1979 and 1980, and a 12% factor between 1981 and 1984.

- Within each industry, there are usually widely varied growth rates among the modes and types of computer services use. These differences are covered in later chapters.

- To allow tracking of processing services by mode of delivery (versus type of service, as will be done below), the same processing services revenues have been spread over the four modes of delivery, and the results are in Appendix D.

B. GENERAL BUSINESS PROCESSING SERVICES

- The market for general business processing services by industry is shown in Exhibit III-4. The discrete manufacturing, banking and finance, and wholesale industries together account for almost 54% of the market for general business processing services. Growth rate will accelerate from 13%, between 1978 and 1979, to 16% as the more rapidly growing RCS based services become more prevalent.

- An opportunity for RCS continues to be human resources systems.

  - Government regulations and complex benefits packages increase the complexity of employee records.

  - CSC is in a joint marketing effort to offer Information Science Inc.'s (InSci) Human Resource System through Infonet. The InSci product includes personnel records, payroll, employment history, EEO compliance data, benefits/ERISA data, OSHA data, attendance information, and job evaluation data.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-4

GENERAL BUSINESS PROCESSING SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 215	$ 246	14%	$ 283	$ 325	$ 374	$ 433	$ 502	15%
PROCESS MANUFACTURING	87	98	13	111	127	145	165	190	14
TRANSPORTATION	25	29	16	34	39	44	50	56	14
UTILITIES	20	23	15	28	33	38	43	48	16
BANKING AND FINANCE	206	239	15	274	315	359	413	472	15
INSURANCE	83	95	15	109	125	144	168	193	15
MEDICAL	26	29	12	32	37	42	48	54	13
EDUCATION	17	20	15	22	25	29	33	38	14
RETAIL	85	95	12	113	133	154	177	201	16
WHOLESALE	158	175	11	203	236	282	327	383	17
FEDERAL GOVERNMENT	21	24	15	32	39	47	57	68	23
STATE & LOCAL GOVERNMENT	20	23	15	29	34	43	54	65	23
SERVICES	52	62	19	74	89	106	125	146	19
OTHER	66	67	2	73	82	93	106	130	14
TOTAL	$1,081	$1,225	13%	$1,417	$1,639	$1,900	$2,199	$2,546	16%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Comshare offers an automated system for compliance with federal wage and price standards which incorporates methods for projecting and analyzing data, based on changing wage and price variables.

- The integration of text processing with data processing is producing services opportunites:

  - An example of a recent announcement in this area is Computer Corporation of America's (CCA) COMET, an electronic mail message service using a PDP-11 under DECnet.

  - Other opportunities are emerging in electronic mail, directory maintenance, and text dominant (such as patent and legal) data bases.

- Applications which assist in financial management for medium and large companies are an opportunity.

  - Most recent vendor activity in this field has been in upgrading existing products, such as McCormack and Dodge, Inc.'s GL Plus, an interactive general ledger system.

  - Tax calculation and tax planning services from vendors, such as Tymshare, are expected to continue to grow at over 20% per year.

  - Comshare acquired Digitax Inc., a nationwide supplier of federal and state income tax and fiduciary tax return processing services.

  - ADP acquired Programmed Tax Systems (PTS) Inc., a large preparer of computerized individual, corporate, and partnership tax returns.

  - Data Resources International (DRI) recently introduced EMPIRE, an integrated modeling analysis and reporting system oriented toward the business planner.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- As reflected in the forecast, federal, state, and local government markets will continue to outpace industry as pressures build to increase efficiency in government. Computer services will fill a part of this requirement.

C. SCIENTIFIC AND ENGINEERING PROCESSING SERVICES

- This market will continue to grow at a slower pace than the total market, as shown in Exhibit III-5.

- Vendors in this market are well established with most activity aimed at enhancing existing programs.

- Market opportunities exist in several areas, including:

  - Integration of graphics capability.
  - Medical research will feed rapid growth in the medical sector from a small current base.

- Boeing Computer Services (BCS) has introduced its Engineering Emphasis product line, including a library of 24 computer aided engineering design modeling and graphics programs.

- United Computing Systems (UCS) has been licensed to offer Garrett Computing System's special usage programs for the petroleum industry.

- UCS has expanded its market penetration by offering a Cray Research based computer service which can handle significantly larger projects than prior systems.

- Typical of the large number of structural engineering programs offered by McAUTO is STRUDL, owned and maintained by McAUTO and Multisystems,

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-5

SCIENTIFIC AND ENGINEERING PROCESSING SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 76	$ 86	13%	$ 94	$ 108	$ 129	$ 156	$ 183	16%
PROCESS MANUFACTURING	45	50	11	60	67	77	89	104	16
TRANSPORTATION	5	5	7	5	6	6	7	7	7
UTILITIES	65	71	9	78	86	96	106	118	11
BANKING AND FINANCE *	-	-	-	-	-	-	-	-	-
INSURANCE *	-	-	-	-	-	-	-	-	-
MEDICAL	2	2	15	2	3	3	3	4	15
EDUCATION	9	9	5	10	10	11	12	13	8
RETAIL *	-	-	-	-	-	-	-	-	-
WHOLESALE*	-	-	-	-	-	-	-	-	-
FEDERAL GOVERNMENT	150	165	10	179	199	217	233	251	9
STATE & LOCAL GOVERNMENT	5	5	9	8	12	17	22	27	40
SERVICES	94	104	11	115	127	143	162	181	12
OTHER	44	47	7	54	62	72	83	94	15
TOTAL	$ 495	$ 544	10%	$ 605	$ 680	$ 771	$ 873	$ 982	13%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $4 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

Inc. The system includes geometric output (including three dimensional views) for framed and continuous structures.

D. INDUSTRY SPECIALTY PROCESSING SERVICES

- Industry specialty processing services are the largest and fastest growing segment of processing services, as shown in Exhibit III-6.

  - Banking and finance continues to be the largest individual sector and maintains its position with 33% of the total market in 1984.

  - Commercial banking applications are a major portion of this sector's revenues, accounting for over $1 billion in 1978 and distributed as follows: $645 million to services companies and $386 million to commercial banks doing processing for other banks.

  - For additional detail in this market see INPUT's 1979 report, "Computer Services Markets in Banking and Finance."

- Both the federal and state/local government sectors are growing rapidly from small bases, as increasing attention is being given to the development of specialized applications for these sectors.

- Utilities, beset by rapidly rising fuel costs, hostile environmental groups, increased governmental regulation, and rampant inflation, are turning outside for both RCS and professional services.

  - Planmetrics, the leading firm in the $45 million financial/corporate planning market segment, is being challenged by a number of RCS vendors including DRI, General Electric Information Services Co. (GEISCO), and National CSS/Economic Sciences.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-6

INDUSTRY SPECIALTY PROCESSING SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 221	$ 261	18%	$ 315	$ 375	$ 440	$ 510	$ 602	18%
PROCESS MANUFACTURING	136	160	18	193	227	275	327	388	19
TRANSPORTATION	81	98	21	116	139	165	195	231	19
UTILITIES	50	63	25	78	87	107	132	163	21
BANKING AND FINANCE	1,068	1,241	16	1,446	1,684	1,962	2,286	2,669	16
INSURANCE	478	544	14	619	706	804	915	1,047	14
MEDICAL	370	420	13	471	542	627	730	846	15
EDUCATION	40	47	16	54	64	75	84	93	15
RETAIL	300	355	18	414	485	570	673	798	18
WHOLESALE	135	157	16	179	205	235	277	321	15
FEDERAL GOVERNMENT	17	21	23	26	32	39	48	59	23
STATE & LOCAL GOVERNMENT	22	25	14	36	52	66	83	100	32
SERVICES	181	216	19	274	309	347	381	424	14
OTHER	114	120	5	146	165	192	220	249	16
TOTAL	$3,213	$3,728	16%	$4,367	$5,072	$5,904	$6,861	$7,990	16%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Informatics, using its Statistical Monitoring System (SAS) and the CCA Model 204 data base management system, has developed an application package to measure the environmental impact of power plant operation.

- American Science and Engineering (ASCE) has developed an on-line energy management system (ASEP) operating on a Data General minicomputer, which monitors consumer usage and gives reduced billing for off peak hour household usage.

- Hospitals represent a major specialty market within the medical sector.

  - GEIS and Hospital Corporation of America (HCA) are in joint development of a distributed hospital information system (HIS) for over 100 HCA owned and operated hospitals.

  - McAUTO introduced a new Patient Care System (PCS) operating on Tandem T16 minicomputers for hospitals with more than 700 beds.

  - HBO and Company offers a Four-Phase minicomputer based hospital information system (HIS) that is linked with RCS vendors, including McAUTO, Tymshare, and Shared Medical Systems (SMS).

  - Further details on this market are contained in INPUT's report, "Computer Services Opportunities in Hospitals" October 1978.

- Other major industry specialties include:

  - Government funded health insurance claims processing is slated to exceed $800 million in 1984 - probably double that if National Health Insurance (NHI) is implemented.

  - Credit union processing, with services demand rapidly escalating to support new credit union powers, such as share draft accounting, credit cards, ATMs, and mortgage credit.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Data bases of all types (financial, economic, industrial, demographic) still offer major opportunities for RCS vendor participation in data base maintenance and delivery.

- United Computing Systems (UCS) now offers the COMPUSTAT data base, consisting of financial and business time series from Securities and Exchange Commission Form 10K and 10Q reports on public companies.

- "Bonds," a data base of information on the over-the-counter bond market is now available from Rapidata.

- Urban Data Processing Inc., offers RCS access to its area profile reporting system, containing complete demographic data for the entire U.S.

E. UTILITY PROCESSING SERVICES MARKET

- A vendor of utility processing services provides access to a computer and/or communications network, with basic software, that enables any user to develop its own problem solution or processing system by using its own staff and/or the vendor's staff.

- Data base management systems and implementation languages are an important source of utility services revenues.

  - Cincom's TOTAL is the most widely used.

  - Informatics offers Computer Corporation of America's DBMS on their RCS network.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Cullinane, the second largest independent DBMS vendor, has IDMS available through Boeing Computer Services (BCS), Datacrown, and Computer Usage Company (CUC).

- Tymshare offers several DBMS/implementation languages which it applies depending on the computer used and application needed.

- NCSS believes that NOMAD with its relational capability gives it a leading advantage in distributed data base applications.

- Computer Sciences Corporation offers MANAGE, a relational data base management system, on INFONET.

- For further detail, see INPUT's report, "Data Base Management Systems Software Markets" June 1978.

- Utility processing services continue to grow most rapidly in government sectors (federal government and state and local governments), as shown in Exhibit III-7. Providing such services to government requires highly specialized marketing and sales techniques.

- The relatively low rate of growth in utility services is largely due to a decline in the sale of "raw time" which is included in this mode of service, and which offsets the rapid growth of more sophisticated problem solving services.

- Micrographics, graphics, and other new input/output devices are growth opportunities where sharing an expensive peripheral has an economic advantage.

  - Expanding its position in micrographics services, ANACOMP has acquired BiCom Inc., and Computer Micrographics Inc.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-7

UTILITY PROCESSING SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 140	$ 159	14%	$ 181	$ 207	$ 233	$ 264	$ 303	14%
PROCESS MANUFACTURING	119	136	14	150	163	194	222	252	13
TRANSPORTATION	29	34	17	39	44	49	54	59	12
UTILITIES	94	107	14	119	132	145	157	170	10
BANKING AND FINANCE	46	51	13	58	65	73	82	95	13
INSURANCE	27	30	11	32	35	39	42	46	11
MEDICAL	12	14	17	15	17	19	21	24	11
EDUCATION	24	27	11	29	31	32	33	34	5
RETAIL	50	56	12	62	68	77	86	98	12
WHOLESALE	101	112	11	120	129	136	143	150	6
FEDERAL GOVERNMENT	362	427	18	503	608	730	880	1,050	20
STATE & LOCAL GOVERNMENT	78	86	10	97	117	137	156	177	16
SERVICES	49	59	20	71	86	103	121	143	19
OTHER	65	76	17	89	105	122	143	166	17
TOTAL	$1,196	$1,374	15%	$1,565	$1,807	$2,089	$2,404	$2,767	15%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Graphics, such as McAUTO's new VIVIDATA package allowing production of bar charts, graphs, pie charts, etc., from computer output data, are an increasing part of the utility processing market.

- Greater attention is being given to the problem of disaster recovery, which is an area in which Sun Information Services and Shared Medical Systems have introduced services. This is not a market area which can be approached as an "incidental" market -it requires very significant investment and marketing.

  - American Satellite Corporation (ASC) has announced Quick Reaction Communications (QRC), offering both data link and voice communications through mobile earth stations. QRC is designed to provide backup communications services within 48 hours after the major destruction of existing facilities.

  - Sun Information Services offers Sunguard, a fully equipped disaster recovery and backup center for IBM oriented users, both on a "hands-on" and on a RCS basis.

F. FACILITIES MANAGEMENT MARKET

- INPUT has, for the first time, separated the facilities management (FM) mode of delivery into two types of services.

  - Processing services, where users purchase services using the vendors' computer facilities and staff on a long-term (greater than one year) basis for its data processing needs. Services provided by McAUTO, SEI, EDS, and Shared Medical Systems fall into this category.

  - Professional services or contract services, where users only purchase services from the vendors' staffs in order to run its (the users') computer facilities. Such services are typically those provided by CSC, SDC, and PRC to the Federal Government.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The breakdown of facilities management services is shown in Exhibit III-8.

- Facilities management analysis in its entirety, has been retained in the processing services market for this Annual Report: in 1980 the professional services segment of FM will be transferred from the processing services to professional services mode.

- The Federal Government is the largest purchaser of facilities management professional services.

  - Ninety-four percent ($270 million) in 1979.

  - Ninety-seven percent ($530 million) by 1984.

  - This growth is based on the continued purchase of FM by the Federal Government particularly for new agencies and programs. INPUT does expect the Federal Government to significantly increase its contracting out of data processing through this and other modes.

G. SOFTWARE PRODUCTS MARKETS

- Software products are growing much more rapidly than processing services, as shown in Exhibit III-9.

  - As will be discussed in more detail in Appendix B, EDP managers interviewed in INPUT's user panel anticipate a growth in expenditures for software products identical to INPUT's latest forecast.

- Software products companies responding to the 1979 ADAPSO survey (who as a group out-performed the industry), actually reported a 38% revenue increase from 1977 to 1978 and forecast a 43% growth from 1978 to 1979.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-8

FACILITIES MANAGEMENT SERVICES BY INDUSTRY SECTOR

INDUSTRY SECTOR	PROFESSIONAL SERVICES 1978 ($ M)	PROFESSIONAL SERVICES 1979 ($ M)	PROFESSIONAL SERVICES 1984 ($ M)	AAGR 1979-1984 (PERCENT)	PROCESSING SERVICES 1978 ($ M)	PROCESSING SERVICES 1979 ($ M)	PROCESSING SERVICES 1984 ($ M)	AAGR 1979-1984 (PERCENT)
DISCRETE MANUFACTURING	$ 5	$ 5	$ 5	–	$ 46	$ 55	$ 138	20%
PROCESS MANUFACTURING	*	*	*	–	34	39	86	17
TRANSPORTATION	*	*	*	–	25	30	50	11
UTILITIES	*	*	*	–	7	8	15	13
BANKING AND FINANCE	*	*	*	–	197	233	512	17
INSURANCE	*	*	*	–	362	411	767	13
MEDICAL	*	*	*	–	135	154	289	13
EDUCATION	*	*	*	–	17	20	43	17
RETAIL	*	*	*	–	5	6	14	18
WHOLESALE	2	2	4	15%	31	36	65	13
FEDERAL GOVERNMENT	245	280	527	13	*	*	*	–
STATE & LOCAL GOVERNMENT	5	5	6	5	19	22	53	19
SERVICES	*	*	*	–	*	*	*	–
OTHER	*	*	*	–	11	11	24	7
TOTAL	$257	$292	$ 542	13%	$ 889	$1,025	$2,058	15%

* BECAUSE THIS INDUSTRY SECTOR HAS LESS THAN $4 MILLION IN 1984 REVENUES, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-9

SOFTWARE PRODUCTS - TOTAL MARKET FORECAST
BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 261	$ 346	32%	$ 456	$ 600	$ 787	$1,038	$1,360	31%
PROCESS MANUFACTURING	133	180	35	248	341	471	649	905	38
TRANSPORTATION	40	54	35	75	103	142	197	274	38
UTILITIES	41	54	31	73	98	130	175	236	35
BANKING AND FINANCE	216	249	15	284	325	370	422	479	14
INSURANCE	162	186	15	214	245	282	324	372	15
MEDICAL	39	51	31	70	94	128	174	237	36
EDUCATION	37	46	24	57	70	86	106	131	23
RETAIL	50	69	38	99	140	200	287	412	43
WHOLESALE	61	82	34	114	161	227	323	461	41
FEDERAL GOVERNMENT	178	223	25	277	344	427	531	661	24
STATE & LOCAL GOVERNMENT	58	70	21	83	98	117	139	166	19
SERVICES	33	44	33	56	73	94	123	158	29
OTHER	35	46	31	64	89	126	179	254	41
TOTAL	$1,344	$1,700	26%	$2,170	$2,781	$3,587	$4,667	$6,106	29%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- EDP managers are increasingly turning toward outside sources for software development. This trend results from:

  - Scarcity of systems analysts and programming personnel.

  - Rapidly escalating in-house personnel costs.

  - The need to meet competition in the company's marketplace is accelerating the demand for new applications.

I. SYSTEMS SOFTWARE MARKETS

- The discrete manufacturing, process manufacturing, and federal government markets total almost 59% of the 1979 market for systems software as shown in Exhibit III-10, reflecting the number of large installations in these sectors.

- The market will pass the $2.0 billion mark in 1982, as IBM continues unbundling its software.

  - The largest single vendor in the market is IBM, with a 33% market share.

  - The largest independent software company, Software Design, Inc. (SDI), has less than 3% of the market.

  - As a group, some 500 independents control 45% of the market.

  - Systems software products for IBM compatible installations comprise 76% of the total market.

- Systems software market segments are:

  - The systems operations market segment (products which manage computer resources during program execution); over $385 million in

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-10

SYSTEMS SOFTWARE PACKAGES - MARKET FORECAST
BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 171	$ 227	33%	$ 302	$ 402	$ 532	$ 708	$ 935	33%
PROCESS MANUFACTURING	103	142	32	196	270	373	515	720	38
TRANSPORTATION	25	34	36	48	67	93	131	183	40
UTILITIES	31	41	32	55	73	96	128	171	33
BANKING AND FINANCE	55	62	13	70	80	91	104	118	14
INSURANCE	51	58	15	67	77	89	102	118	15
MEDICAL	17	24	40	34	47	66	92	129	40
EDUCATION	28	35	25	44	55	68	85	107	25
RETAIL	24	35	46	53	79	118	177	265	50
WHOLESALE	16	24	50	37	58	91	142	220	56
FEDERAL GOVERNMENT	163	204	25	255	319	398	498	623	25
STATE & LOCAL GOVERNMENT	46	55	20	66	79	95	114	137	20
SERVICES	12	16	33	21	29	38	52	69	34
OTHER	13	19	46	29	43	65	99	150	51
TOTAL	$ 755	$ 976	29%	$1,277	$1,678	$2,213	$2,947	$3,945	32%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

1978, is growing at 33%/year. Product examples are: IBM's IMS and CICS, ADABASE from Software AG, and TASK/MASTER from Turnkey Systems (now a part of National CSS).

- The systems utilization product segment (products which aid in more effective computer system utilization); over $80 million in 1978, is growing at 30% a year. Product examples are: RESOLVE from Boole and Babbage, FDR from Innovation Data Processing, and UCC ONE from University Computing Company.

- The implementation systems market segment (products which prepare applications for execution); $290 million in 1978, is growing at 33% a year. Product examples are: Informatics' MARK IV, PANVALET from Pansophic Systems, and ADR's AUTOFLOW and METACOBOL.

- Vendors expect IBM to continue moving operating systems functions into microcode, as indicated by the Series 4300.

- Further details are found in INPUT's report, "Opportunities in Marketing Systems Software Products" August 1979.

2. APPLICATIONS SOFTWARE MARKETS

- Heavy penetration of applications software into the banking and finance, insurance, and discrete manufacturing sectors results in 60% of the total 1979 market by these sectors.

  - Overall growth is very strong, as shown in Exhibit III-11.

  - The $1.0 billion threshold will be passed in 1981.

- In a recent survey, INPUT identified nearly 1,500 individual applications software products sold by almost 400 vendors. The data is summarized in Exhibit III-12 by industry sector.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-11

APPLICATIONS SOFTWARE PACKAGES - MARKET FORECAST
BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 90	$ 119	31%	$ 154	$ 198	$ 255	$ 330	$ 425	29%
PROCESS MANUFACTURING	30	38	27	52	71	98	134	185	37
TRANSPORTATION	15	20	33	27	36	49	66	91	35
UTILITIES	10	13	30	18	25	34	47	65	38
BANKING AND FINANCE	161	187	16	214	245	279	318	361	14
INSURANCE	111	128	15	147	168	193	222	254	15
MEDICAL	22	27	23	36	47	62	82	108	32
EDUCATION	9	11	18	13	15	18	21	24	17
RETAIL	26	34	31	46	61	82	110	147	34
WHOLESALE	45	58	29	77	103	136	181	241	33
FEDERAL GOVERNMENT	15	19	24	22	25	29	33	38	15
STATE & LOCAL GOVERNMENT	12	15	25	17	19	22	25	29	14
SERVICES	21	28	31	35	44	56	71	89	26
OTHER	22	27	23	35	46	61	80	104	31
TOTAL	$ 589	$ 724	23%	$ 893	$1,103	$1,374	$1,720	$2,161	24%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-12

APPLICATIONS SOFTWARE PRODUCTS AVAILABLE IN THE U.S.

INDUSTRY	NUMBER OF PRODUCTS AVAILABLE	PERCENT OF TOTAL PRODUCTS	NUMBER OF VENDORS	PERCENT OF VENDORS	AVERAGE NUMBER OF PRODUCTS PER VENDOR
DISCRETE MANUFACTURING	550	38%	170	45%	3.2
PROCESS MANUFACTURING	50	3	25	7	2.0
TRANSPORTATION	20	1	10	3	2.0
UTILITIES	35	2	15	4	2.3
BANKING AND FINANCE	330	23	130	34	2.5
INSURANCE	130	9	35	9	3.7
EDUCATION	60	4	25	7	2.4
MEDICAL	115	8	35	9	3.3
RETAIL	50	3	25	7	2.0
WHOLESALE	25	2	20	5	1.3
GOVERNMENT	25	2	10	3	2.5
SERVICES & OTHER	60	4	50	13	1.2
TOTAL	1,450	100%	380*	NA	3.8

NA = NOT APPLICABLE

* COLUMN WILL NOT ADD UP TO 380 BECAUSE MANY VENDORS SERVE MORE THAN ONE INDUSTRY

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Software products available for the banking and finance, insurance, medical, and discrete manufacturing industry sectors represent nearly 80% of all software products available.

- The other industries tracked by INPUT each account for no more than 4% of the total available software products.

- The average applications software product vendor sells four different systems. This is at least twice as high as the average for systems software vendors.

- Almost one-half of the vendors offer at least one discrete manufacturing applications software product.

- One in three vendors offer a banking and finance applications software product.

- Software vendors may be able to increase revenues by preventing unauthorized use of proprietary products through a recent patent which uses a vendor supplied microprocessor chip to decrypt vendor encrypted object code, on the users host, as the instruction is fetched for execution.

H. PROFESSIONAL SERVICES MARKETS

- Professional services, particularly custom programming, will continue to grow through the forecast period, as shown in Exhibit III-13:

  - The federal government will actually increase its portion of the total market from 26% in 1979 to 27% in 1984, as this sector continues to lead in its use of outside programming and systems design talent.

  - Planning Research Corporation (PRC) was awarded the Army's first contract for a contractor owned and operated computer services center

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT III-13

PROFESSIONAL SERVICES - TOTAL MARKET FORECAST
BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 210	$ 253	20%	$ 306	$ 370	$ 447	$ 540	$ 645	21%
PROCESS MANUFACTURING	115	137	19	169	207	255	314	383	23
TRANSPORTATION	28	33	18	42	54	69	89	115	28
UTILITIES	66	78	18	92	109	128	151	178	18
BANKING AND FINANCE	108	127	18	146	168	193	222	254	15
INSURANCE	110	123	12	138	155	173	194	219	12
MEDICAL	46	54	17	58	63	68	73	80	8
EDUCATION	36	43	19	49	56	64	73	84	14
RETAIL	50	59	18	70	84	99	118	140	19
WHOLESALE	42	49	17	58	68	81	95	114	18
FEDERAL GOVERNMENT	350	419	20	503	603	724	869	1,043	20
STATE & LOCAL GOVERNMENT	142	169	19	194	224	258	299	345	15
SERVICES	11	13	18	15	18	21	25	30	18
OTHER	54	64	19	78	95	116	142	173	22
TOTAL	$1,368	$1,621	18%	$1,918	$2,274	$2,696	$3,204	$3,803	19%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

at Ft. Hood, Texas. PRC will support Army field testing and evaluation of new equipment and tactics under simulated battle conditions.

- Typical of CSC's professional services activities is a three-year, $15 million contract to provide analysis and programming services to the Army's Computer Systems Command Support Group for work on the Standard Army Multi-Command Management Information Systems.

I. TURNKEY SYSTEM MARKETS

- INPUT studied the turnkey systems market for the first time in 1979. A separate report, "Turnkey Systems Markets" presents detailed findings and forecasts.

- Turnkey systems are defined as a combination of hardware and software integrated into a total system that is designed to completely fulfill the processing requirements of a single application or set of applications for a user.

- Turnkey systems expenditures are not included in any of the computer services forecasts, so that these forecasts are additive to the data already presented.

  - The market for turnkey systems will approach $19 billion by 1984, growing from $4 billion in 1979.

  - The hardware component of turnkey systems will be between 40-50% of the total system price.

  - Software products and custom software will represent nearly 40% of the total system price.

  - Over 60,000 turnkey systems will be shipped in 1979.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Turnkey system vendors are finding the greatest degree of success when they sell an industry or function specific system. Product examples are a taxicab dispatching system, an oil and gas lease accounting system, and a personnel data base system.

J. VENDOR ACTIVITY ACROSS INDUSTRY SECTORS

- Vendor activity which cuts across most industry sectors has been selected for presentation in this section according to major industry issues. Selected vendor activity primarily related to a market sector is included in one of the 14 sectors that follow the integrated analyses of in-house EDP.

1. USER SITE HARDWARE SERVICES (USHS)

- Computer services vendors continue to add user site hardware services to their product offerings.

  - ADP Onsite was the first such offering in the utility processing services category. According to recent estimates, ADP now has approximately 26 installations of Onsite.

  - GEIS has announced the MarkLink service using a Texas Instrument (TI) minicomputer.

  - Shared Medical Systems' (SMS) Action system uses Four-Phase 490 or DEC 11/70 minicomputers connected to a SMS host for hospital support functions.

  - IBM Canada has announced "Base," a service for security brokers using the IBM Series 8100 to handle local files, connected to a data center host for access to financial data bases.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- McAUTO has developed a new minicomputer based hospital related Patient Care System (PCS).

- Scientific Time Sharing Corporation (STSC) announced the Quad 100 system, but backed off entry when IBM announced the Series 4300.

- NCSS offers a minicomputer (3200) which is capable of being integrated into a USHS. NCSS presently has 20 3200 installations.

- Control Data is poised to enter this market. It is a company objective to integrate minicomputers into services in 1980.

- Further details can be found in INPUT's forthcoming multiclient study, "Market Opportunities for User Site Hardware Systems."

2. DATA BASE MANAGEMENT SYSTEMS (DBMS)

- Computer Resources Inc. offers IMS/3000, a command, query, and update system for the HP 3000.

- Intel completed acquisition of MRI Systems Corp. in preparation of developing a firmware data base management system.

- Infodata Systems Inc. has announced IQ/net, a distributed data base/information management system for the IBM 4300 series systems.

- Mathematica has developed RAMIS 3200, a RAMIS II data management system for the NCSS 3200.

- Applied Data Research acquired Insyte's Datacomm Corporation. Software products acquired include: DataCom/DB, a DBMS, and data entry, query, dictionary, and report writer systems.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Software AG offers an instant on-site support plan for both its DBMS, ADABAS, and its program development system, COM-PLETE, through a remote dial-up diagnostic maintenance service.

- Condor Computer Corporation has developed a relational DBMS for the microprocessor based ZILOG Z80.

3. DISASTER RECOVERY

- Disaster recovery operations centers, operated by independent vendors are gaining momentum as the preferred method of assuring continued computer operation in case of catastrophe. Beside Sun Information Services SUNGUARD service, other vendors are:

  - Contingency Group Inc., a Chicago based firm offering access within four hours, on-site or through teleprocessing, to an IBM 370/165 II.

  - Data Processing Security Inc., a Texas based consulting firm, plans to open the first of six Recovery Operations Centers (ROC) in the Dallas-Fort Worth metropolis.

  - Shared Standby Systems, Inc., a subsidiary of Shared Medical Systems, offers Operations Standby, for large scale IBM compatible users. The greater Philadelphia area disaster recovery center houses an 8 MB IBM 3033 with extensive telecommunications capability.

  - Remote Computing Corporation (RCC) offers their Critical Applications Back-Up Service (CABS) to Burroughs large scale systems users.

4. ACQUISITIONS

- Acquisitions continue to play a vital role in computer service industry growth, accounting for 3.6% of 1978 ADAPSO respondent total revenues, more than double that reported for 1977.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Two major acquisitions occurred in 1979 that foretell the broadening of the spectrum of products and services, integrated with computer services, offered by computer services vendors.

  - McGraw Hill, a leading publishing company, acquired Data Resources, Inc., for $105 million.

  - Dun and Bradstreet, a leading financial and information services company, acquired National CSS for the equivalent of $150 million.

- Broadening its position as the leading general business services vendor, ADP announced three U.S. acquisitions: significantly, all three operate in personnel related activities, and the degree of computer services in at least one is relatively small:

  - Bierly and Associates; a Southern California firm involved in workmen's compensation claims processing.

  - Reed Roberts Associates, Inc.; a New York firm engaged in employee expense programs, including unemployment compensation.

  - Programmed Tax Systems (PTS); which does computerized individual, corporate, and partnership tax services.

- The Reynolds and Reynolds Company has acquired Accumation, a West Coast computer services firm with $5 million 1979 revenues, offering computer tax and accounting services.

- EDS has reached agreement to acquire Compusource Corporation, a small business computer software products specialist. EDS has also acquired a $20 million government oriented professional services company, Potomac Research.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- In a continuing plan to expand its Data Services Group offerings, CSC acquired EMS Industries, a computer services firm, with $3 million 1978 annual revenues, providing RCS services with the Distributed Automated Real Time System (DARTS). CSC will also acquire a significant portion of Itel's now defunct Data Services Division.

- Further details are found in INPUT's report, "Acquisition Strategies for Computer Services Companies" March 1979.

5. DISTRIBUTED DATA PROCESSING (DDP)

- Hewlett-Packard, with its Distributed Systems Network Architecture (HP-DSN), has greatly expanded its product line for distributed applications.

- Honeywell's new Distributed Systems Environment (DSE) supports all Honeywell processors from Level 6 minicomputers to Level 66 mainframes.

- With its new System IV/60, Four-Phase Systems hopes to counter the IBM 8100 in the DDP marketplace.

- IBM has announced products which can be used in a DDP environment, in particular the Series 8100 and 4300. However, most emphasis for DDP continues to emanate from IBM GSD with the Series/1.

- Tymshare is field testing a TI microcomputer based, intelligent terminal and the DEC 2020 mega minicomputer at selected user sites while evaluating entry into DDP. It is also evaluating some plug compatible DEC products for use in this area.

- Mainframe vendors are acquiring minicomputer vendors to accelerate expansion into the DDP and telecommunications network environment.

  - Univac acquired Varian Data Machines and subsequently announced the new SUMMIT operating system for the V77 series geared for DDP.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- NCR acquired COMTEN to speed implementation of its Distributed Network Architecture (DNA).

- Honeywell acquired Incoterm to expand its base of intelligent terminals for DDP.

- Datapoint recently announced an Attached Resource Computer (ARC) system to permit a number of processors to be linked together to share execution of a distributed data processing application as if it were run on a mainframe.

6. SMALL BUSINESS COMPUTERS

- This rapidly growing market area is involving both hardware vendors and computer services vendors. Opportunities for software products vendors are almost unlimited.

- DEC, with at least six stores, has joined Data Access Systems (DASI), NCR, Pertec, IBM, Tandy, and others in selling small business/personal computers at the retail level.

  - Tandy Corporation has opened over 50 Radio Shack Computer Centers for its home computer offerings. Over 200 centers should be open before year end, 1979.

  - IBM has opened computer showrooms across the country to sell its system 5110.

  - Computerland Corporation, which operates over 70 franchised stores, will market Processor Technology Corporation's line of SOL micro-computers.

- AT&T plans to offer an "Integrated Digital Services Network" (IDSN) to consumers, at home, in the 1980s.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- CompuServ offers its MICRONET services for personal and small business computers. The service allows communication through a "community bulletin board."

- Hewlett-Packard is planning entry into the personal computer market with the Capricorn system.

- Telecomputing Corporation of America (TCA) offers some 30 services, including word processing, stock reports, and electronic mail, through its Source system to personal computer users.

- American Management Systems (AMS) has introduced Generation 5 (GF5), which AMS claims is a new concept in financial system development for manufacturing, retailing, distribution, and service-oriented companies. GF5 allows for the design and implementation of a turnkey system on the PDP-11 in less than 50 percent the time required using other methods.

  - The announcement signals the move of AMS, a government oriented professional services company, into the commercial turnkey systems area.

7. WORD PROCESSING

- Word processing, the leading edge of office automation, is rapidly moving from standalone, single function to shared logic, multifunction systems.

- Tymshare offers "Augment," an office automation system that covers such functions as note taking, text editing, text revision, graphics, and communication.

- Bowne Information Systems, the leading RCS vendor in computer-assisted text editing and report preparation, recently announced its "Bowne Connection" compatibility program, making its software accessible to most major word processing hardware. Bowne also implemented "Cyberway," a series of service

© 1979 by INPUT, Palo Altc, CA 94303. Reproduction Prohibited.

centers throughout the U.S., to offer and assist in installing word processing services.

- Proprietary Computer Systems (PCS) recently enhanced its PCS/text with video wordstream and automatic abstracting capabilities.

- Wang Laboratory's new office information system, OIS/140, combines text editing with information processing. The system includes work stations, printers, photocomposition, telecommunications, and optical character recognition.

- Xerox, with its recent announcement of the 860 Series and Ethernet is building a base for future data/text products and services.

- EXXON Information Systems, through its Vydec and Qyx divisions, is making significant inroads into the office automation marketplace.

- Digital Equipment Corporation (DEC), offering a broad line of shared logic plus combined word/data processing systems, is also developing full function office automation systems.

- CallData Systems has introduced REMOTEXT, a remote, automated, text editing system for catalog, directory, and manual production.

8. OTHER PRODUCTS AND SERVICES

- Informatics continues to enhance its Mark IV management information system, adding graphics, which will generate charts on a line printer, and adding the ability to handle two-dimensional arrays.

- National CSS introduced Documaster, an information storage and retrieval system for unstructured data.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Management Science America (MSA) integrated eight of its interactive software packages into a shared information system for controlling, performing, and managing corporate wide personnel and financial functions.

- Software International has integrated its general ledger and financial reporting system to produce a financial reporting and work management system providing general ledger, account management, and project control operations.

- Capex Corporation has introduced Manage IMS to control processing, simplify planning, and improve IMS performance.

- Sun Information Services has introduced PREMIS, a multi-project resource management system, and PICOM, a project information and cost management system.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

IV DISCRETE MANUFACTURING INDUSTRY SECTOR MARKETS

IV DISCRETE MANUFACTURING INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- The discrete manufacturing industry sector is characterized by companies which manufacture products that are sold as units; e.g., automobiles and calculators, rather than bulk products, such as petroleum or cement. The latter products are covered in the next section, Process Manufacturing Industry Sector.

- 1976 revenues from shipments totaled almost $540 billion, as shown in Exhibit IV-1.

- Characteristics of discrete manufacturing include:

  - Very high employment, exceeding 15 million employees in 1978, or 17% of the total employed civilian labor force.

  - A wide variation in the implementation of technology; from a low level in industry subsectors such as apparel, to a medium level in industry subsectors such as printing, to a high level in the electronics industry subsector.

  - Widely varying management styles within industry subsectors, which affect the implementation of EDP within each subsector.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IV-1

DISCRETE MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$538.1 BILLION 188,572 15,156,000
23	APPAREL	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$34.8 BILLION 22,311 1,316,000
25	FURNITURE	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$14.2 BILLION 8,630 486,000
27	PRINTING	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$42.8 BILLION 41,877 1,181,000
31	LEATHER	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$7.1 BILLION 2,827 251,000
34	FABRICATED METAL PRODUCTS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$77.5 BILLION 29,349 1,653,000
35	MACHINERY	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$105.5 BILLION 41,506 2,337,000
36	ELECTRONICS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$73.9 BILLION 12,574 1,966,000
37	TRANS-PORTATION EQUIPMENT	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$141.0 BILLION 8,536 4,858,000

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IV-1 (CONT.)

DISCRETE MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
38	SCIENTIFIC AND CONTROL INSTRUMENTS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$25.0 BILLION 6,288 654,000
39	MISCEL-LANEOUS MANU-FACTURERS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$16.3 BILLION 14,674 454,000

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The largest industry subsector is transportation, with 1976 revenues totaling 26% of the total industry sector, and dominated by the automotive industry.

- While most industries are being pressed to increase prices due to rising cost of labor and materials, electronics companies, in particular, are using technology to reduce product prices.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The market for computer services in the discrete manufacturing sector will grow faster than the industry average, or 22%, as shown in Exhibit IV-2.

- All modes of service will grow through the forecast period with software leading the way.

  - Systems software will grow at the overall industry average rate of 33%.

  - Applications software will grow faster than the industry average, reflecting the tendency of manufacturing companies to purchase software products when available. The size of the market and the 29% growth rate also reflect the wide range of software products available to manufacturing companies.

  - Most of the applications software products acquired will be for non-manufacturing applications, such as personnel and finance.

- Professional services will grow at 21%. This is indicative of the perceived need of the largest companies to obtain software tailored to their individual operations, especially in manufacturing and accounting applications.

- RCS will grow at 20% per year through the forecast period.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IV-2

COMPUTER SERVICES MARKET FORECAST -
DISCRETE MANUFACTURING SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 45	$ 54	20%	$ 65	$ 78	$ 93	$ 112	$ 134	20%
	SCI. & ENG.	50	60	20	67	80	100	125	150	20
	IND. SPEC.	135	161	19	200	245	295	350	424	21
	UTILITY	70	82	17	97	115	135	160	190	18
SUBTOTAL		300	357	19	429	518	623	747	898	20
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	5	5	10	6	7	8	10	12	19
	IND. SPEC.	26	31	19	37	45	55	65	78	20
	UTILITY	20	24	20	29	35	40	45	53	17
SUBTOTAL		51	60	18	72	87	103	120	143	19
BATCH	GEN. BUS.	170	192	13	218	247	281	321	368	14
	SCI. & ENG.	21	21	0	21	21	21	21	21	0
	IND. SPEC.	60	69	15	78	85	90	95	100	8
	UTILITY	50	53	6	55	57	58	59	60	3
SUBTOTAL		301	335	11	372	410	450	496	549	10
TOTAL PROCESSING	GEN. BUS.	215	246	14	283	325	374	433	502	15
	SCI. & ENG.	76	86	13	94	108	129	156	183	16
	IND. SPEC.	221	261	18	315	375	440	510	602	18
	UTILITY	140	159	14	181	207	233	264	303	14
TOTAL		$ 652	$ 752	15%	$ 873	$ 1,015	$1,176	$ 1,363	$ 1,590	16%
SOFTWARE PRODUCTS	SYSTEM	$ 171	$ 227	33%	$ 302	$ 402	$ 532	$ 708	$ 935	33%
	APPLICATION	90	119	31	154	198	255	330	425	29
TOTAL		$ 261	$ 346	32%	$ 456	$ 600	$ 787	$1,038	$1,360	31%
PROFESSIONAL SERVICES		210	253	20	306	370	447	540	645	21
GRAND TOTAL		$1,123	$1,351	19%	$1,635	$1,985	$2,410	$2,941	$3,595	22%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

  - Turnkey systems successes in manufacturing companies have caused these companies to closely examine the benefit/cost relationship of RCS. To date, turnkey systems have not displaced RCS in a major way, but the potential for intense competition is building.

  - RCS companies can maintain their present advantage through enhanced software applications and the offering of user site hardware services to new prospects as well as to existing clients.

- Batch processing will grow slightly faster than the overall industry rate. Many smaller companies are using general business batch services for payroll, receivables, payables, and general ledger accounting.

- General business batch applications, currently 80% of total general business processing applications, are vulnerable to replacement by small standalone systems.

- Scientific and engineering processing services will continue to grow from a modest base as entrenched competitors enhance current products or add related products.

- Industry specialty processing currently represent the largest single market segment. Numerical control, computer assisted design and manufacturing (CAD/CAM), and material requirements planning (MRP) are examples of processing services targeted to discrete manufacturing.

- Utility based services show modest growth with DBMS based services outperforming the average.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

C. EDP USAGE

- INPUT's 1979 user panel includes 107 EDP managers in the discrete manufacturing sector. Their responses to a detailed questionnaire are the basis for this section.

- Average expenditures for outside services by EDP managers are shown in Exhibit IV-3.

  - Note should be made that the expenditures are only by EDP managers and therefore do not include end user expenditures.

  - EDP managers forecast that they will buy less outside services than they actually end up buying.

- EDP managers purchased 20% more outside services in 1978 than the overall industry average.

  - Interactive processing, input/output services, systems software, EDP consulting, and hardware maintenance are the major categories where discrete manufacturing companies spend more than do most other industries.

  - The growth rate in the purchase of outside services between 1978 and 1979 is estimated by EDP managers to increase by 15%. This is probably conservative, based on EDP managers' computer services usage in the past.

D. VENDOR ACTIVITIES

- Computer Task Group, Inc. (CTG) has developed MATRIX, a manufacturing system designed for the production of both simple repetitive items and

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IV-3

AVERAGE EXPENDITURES FOR SERVICES AND
SOFTWARE IN THE DISCRETE MANUFACTURING SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$ 0-480	$ 33	$ 0-600	$ 36	10%	(4%)
REMOTE BATCH	0-300	6	0-90	2	(66)	(2)
BATCH	0-70	2	0-50	2	(27)	(2)
INPUT/OUTPUT	0-500	17	0-600	17	1	5
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-500	36	0-750	44	23	14
APPLICATIONS SOFTWARE	0-500	19	0-800	28	46	23
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-600	26	0-640	35	36	5
EDP CONSULTING	0-500	17	0-250	12	(27)	3
EDUCATION	0-78	7	0-85	8	12	1
OTHER	0-5	-	0-6	-	(5)	-
FACILITIES MANAGEMENT	0-75	1	0-75	1	-	-
MAINTENANCE						
HARDWARE	0-700	55	0-750	60	9	3
SOFTWARE	0-300	7	0-95	5	(37)	5
TOTAL OUTSIDE SERVICES EXPENDITURES	$0-2,575	$228	$0-2,718	$ 263	15%	3%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

complex custom products. Designed for small to medium sized firms and manufacturing departments of large corporations, MATRIX features a system of matrix modules, which permits the generation of exact bill of material and labor for infinite product variations, and the ability to do product modeling.

- It is particularly suited to the manufacture of a variety of custom or standard products produced from a common inventory which must be cut, stamped, formed, machined and assembled to a final product.

- The system sells for $36,000-$68,000 for multiplant installation. It runs on IBM System 3, 34, 38, 360, 370 using RPG II or Cobol.

- Xerox Computer Services enhanced its interactive RCS offerings to manufacturers by introducing an intelligent terminal which allows significant user site processing. This is a response to the threat from on-site minicomputers offered by hardware manufacturers and turnkey vendors.

- Martin Marietta Data Systems has also moved into the turnkey market for manufacturers. It has taken its successful MAS product and packaged it for HP 3000 computers.

- Anstat has announced an on-line inquiry system for the apparel industry. The system provides access to files for orders, shipments, and customer information.

- Honeywell has developed a series of software packages that, together, form a factory management system.

  - Information provided includes work-in process, production scheduling, parts and materials inventory, shipping and receiving status, and time and attendance reporting.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The software operates on a Level 6 system in a standalone or distributed processing environment. In the distributed processing environment, the software can also operate on the Series 60 and other mainframe computers.

- Hardware costs start at $22,000, with a typical system costing $117,000.

- Software costs include $7,000 for systems software plus up to $300 per month for the factory management applications software.

- Diversified Data Systems introduced its SUMMIT manufacturing control system as a softwre package. The product is geared to the entire manufacturing area.

  - The product uses a data management system, is written in COBOL, and operates on a Perkin-Elmer minicomputer in an interactive environment.

  - The system is modular in nature so that specific functions may be added or deleted from the system as required.

- RAND Information Systems markets a distribution software package for the discrete manufacturing industry.

  - Named the Comprehensive Industry Distribution System (CIDS), the package handles order entry, order tracking, inventory control, transportation control, shipping control, stock transfers, and credit.

  - The system has the key advantage of being able to capture and summarize large quantities of operating detail related to the physical movement of products.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The CIDs' operating environments are IBM/370 OS/VS1, OS/VS2, and IMS/VS-PL/1 (optimized).

- The Computer Workshop of Kansas City has developed a microcomputer based system for manufacturing inventory control and bill-of-materials processing.

  - The microcomputer is the AM-100 from Alpha Microsystems.

  - The turnkey system price is $4,000.

- Thermo Electron Corporations' Holcroft Division developed a highly specialized computer-aided-design system.

  - The system is used to improve the design and energy use in furnaces.

  - Hardware used is an HP 1000, plus a Tektronix graphics display terminal.

- There are many other manufacturing systems available.

  - At least eight hardware manufacturers have software solutions to materials requirements planning, inventory control, capacity planning, and production control problems. All of these software solutions are available on minicomputers.

  - Two "Big-8" accounting firms, Arthur Andersen and Price-Waterhouse, have developed and now license MAC-PAC and MAPCOS respectively. These packages are used for planning and control of manufacturing functions.

  - Over 200 independent software companies are currently offering manufacturing systems as software products, turnkey systems, or both.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- At least 17 computer processing companies, including most of the largest, offer manufacturing systems that compete directly with the software companies and hardware manufacturers.

- Manufacturing Data Systems, which has established itself as a leading vendor of numerical control systems, is expanding into the CAD/CAM arena with a graphics oriented product. Market testing should begin in 1980.

- General Electric Information Services acquired Mitrol, a company which developed and marketed a manufacturing planning and control software system.

  - The software was previously available on National CSS's network as well as on the Mitrol network.

  - The software can be licensed to individual customers for in-house computer use.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

V PROCESS MANUFACTURING INDUSTRY SECTOR MARKETS

V PROCESS MANUFACTURING INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- Products produced by companies in this sector tend to be sold in volume measures (petroleum, cement) rather than in the unit measures (automobiles, television sets) characteristic of discrete manufacturing companies.

- The industry sector is characterized by fewer companies with high revenues per establishment, particularly in the tobacco and petroleum subsectors, as shown in Exhibit V-1.

- Approximately one-half of the shipment value from the industry is derived from the mining and food products subsectors, with shipments being nearly equally split between the two subsectors.

- Process manufacturing shipments are over 60% higher than discrete manufacturing shipments, yet process manufacturing has only 60% of the employees of discrete manufacturing.

- The technology used in process manufacturing is generally older than in discrete manufacturing.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT V-1

PROCESS MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	VALUE OF SHIPMENTS NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES	$882.7 BILLION 154,036 8.5 MILLION
10	METAL MINING	VALUE OF SHIPMENTS (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$5.2 BILLION 819 87,509
11	ANTHRACITE MINING	VALUE OF SHIPMENTS (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$198.5 MILLION 182 4,595
12	COAL MINING	VALUE OF SHIPMENTS (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$12.5 BILLION 3,850 211,318
13	OIL AND GAS EXTRACTION	VALUE OF SHIPMENTS (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$34.8 BILLION 14,069 279,458
20	FOOD PRODUCTS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$180.9 BILLION 24,113 1.7 MILLION
21	TOBACCO	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$8.7 BILLION 262 73,000
22	TEXTILE PRODUCTS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$36.4 BILLION 6,580 911,000
24	LUMBER AND WOOD PRODUCTS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$31.2 BILLION 30,487 751,000

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT V-1 (CONT.)

PROCESS MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
26	PAPER PRODUCTS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$48.2 BILLION 5,891 615,208
28	CHEMICALS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)	$104.1 BILLION 11,032 1.1 MILLION
29	PETROLEUM	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$82.3 BILLION 1,982 143,829
30	RUBBER AND PLASTICS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$31.8 BILLION 9,707 648,595
32	STONE, GLASS CLAY	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$30.6 BILLION 15,713 580,512
33	PRIMARY METALS	VALUE OF SHIPMENTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$77.5 BILLION 29,349 1.4 MILLION

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The average overall growth of computer services revenues in the process manufacturing sector will be 24%, which is higher than the overall computer services industry average, as shown in Exhibit V-2.

- With regard to modes of processing service, RCS shows the strongest growth, reflecting the dispersed nature of establishments in this industry sector, and their increasing need to communicate.

  - RCS will account for 70% of the total processing services market to this sector by 1984, up from 57% in 1977.

  - Financial consolidation and cash management services have high potential.

- Batch services will be impacted by a move to in-house EDP, but a market remains for batch/RCS combinations at smaller establishments. Turnkey systems will continue to be a factor with the smaller establishments and will pose tough competition for batch services.

- Scientific and engineering processing services continue their modest growth with the petroleum industry subsector being dominant with almost half of the revenues.

- Industry specialty is the fastest growing type of processing service, with applications such as route accounting for the dairy industry and seismic data processing for petroleum as examples of the diversity of programs being offered.

- Software products sales are growing at 38% a year. This is higher than the overall industry software growth average of 30%. Software product revenue will account for over 40% of entire services revenue by 1984, up from less than 25% in 1979.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT V-2

COMPUTER SERVICES MARKET FORECAST - PROCESS MANUFACTURING SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 35	$ 42	20%	$ 50	$ 60	$ 72	$ 86	$ 104	20%
	SCI. & ENG.	30	34	15	43	50	60	72	86	20
	IND. SPEC.	82	98	20	120	144	180	220	268	22
	UTILITY	79	94	19	106	117	145	170	197	16
SUBTOTAL		226	268	19	319	371	457	548	655	20
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	2	2	15	3	3	3	3	4	15
	IND. SPEC.	27	32	19	39	45	53	61	70	17
	UTILITY	5	5	10	6	7	9	10	12	19
SUBTOTAL		34	39	15	48	55	65	74	86	17
BATCH	GEN. BUS.	52	56	7	61	67	73	79	86	9
	SCI. & ENG.	13	14	8	14	14	14	14	14	0
	IND. SPEC.	27	30	11	34	38	42	46	50	11
	UTILITY	35	37	6	38	39	40	42	43	3
SUBTOTAL		127	137	8	147	158	169	181	193	7
TOTAL PROCESSING	GEN. BUS.	87	98	13	111	127	145	165	190	14
	SCI. & ENG.	45	50	11	60	67	77	89	104	16
	IND. SPEC.	136	160	18	193	227	275	327	388	19
	UTILITY	119	136	14	150	163	194	222	252	13
TOTAL		$ 387	$ 444	14%	$ 514	$ 584	$ 691	$ 803	$ 934	16%
SOFTWARE PRODUCTS	SYSTEM	$ 103	$ 142	38%	$ 196	$ 270	$ 373	$ 515	$ 720	38%
	APPLICATION	30	38	27	52	71	98	134	185	37
TOTAL		$ 133	$ 180	35%	$ 248	$ 341	$ 471	$ 649	$ 905	38%
PROFESSIONAL SERVICES		115	137	19	169	207	255	314	383	23
GRAND TOTAL		$ 635	$ 761	20%	$ 931	$1,132	$1,417	$1,766	$2,222	24%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The greatest growth in dollars is in systems software.

- There are many large computers installed, especially in petroleum companies. These companies tend to buy a great deal of systems software, but write their own applications software.

- The large companies generally buy new hardware as soon as it is available. This is another stimulant to systems software growth.

- Professional services is growing at 23%, compared to 19% for all industries. This reflects the need for customized solutions and the ability to pay for customization on the part of process manufacturing firms.

C. EDP USAGE

- INPUT's 1979 user panel includes 96 EDP managers in the process manufacturing industry. Their responses to a detailed questionnaire form the basis for this section.

- EDP managers purchased 25% less outside services in 1978 than the overall industry average.

  - Process manufacturing EDP managers purchased less outside services in nearly each category shown in Exhibit V-3 than other industries.

  - The growth rate in the purchase of outside services between 1978 and 1979 is estimated by EDP managers to increase 33%. This growth rate will bring process manufacturing outside services expenditures to within 15% of the overall industry average by year end 1979.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT V-3

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE PROCESS MANUFACTURING SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$0-600	$ 24	$0-1,200	$ 44	82%	(2%)
REMOTE BATCH	0-75	3	0-650	12	277	–
BATCH	0-397	9	0-270	7	(23)	2
INPUT/OUTPUT	0-50	3	0-60	3	8	1
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-500	25	0-750	27	7	19
APPLICATIONS SOFTWARE	0-200	20	0-380	27	31	8
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-700	33	0-500	30	(12)	(2)
EDP CONSULTING	0-50	3	0-50	2	(17)	3
EDUCATION	0-29	4	0-28	5	28	11
OTHER	–	–	–	–	–	–
FACILITIES MANAGEMENT	–	–	0-17	–	–	–
MAINTENANCE						
HARDWARE	0-180	20	0-210	22	8	1
SOFTWARE	0-80	2	0-16	1	(46)	15
TOTAL OUTSIDE SERVICES EXPENDITURES	$0-1,300	$147	$0-1,850	$ 179	22%	4%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

D. VENDOR ACTIVITIES

- Metro Systems recently added an oil and gas accounting system to its product line. The system handles crude oil purchases, tax reporting, and pricing.

- MERMAQ is now offering a turnkey system aimed at oil and gas exploration companies. This is a market specialized by both application and geographic location.

- United Computing Services acquired a Cray computer to do scientific and engineering processing.

  - The Cray system is front-ended by a Control Data Cyber 175.

  - It is being used to provide processing services to many firms in the process manufacturing industry, particularly petroleum companies.

- Honeywell is now selling a material requirements planning system for process manufacturing firms.

  - The system has been successfully installed at Union Carbide.

  - The system operates on a Honeywell Level 62 computer.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

VI TRANSPORTATION INDUSTRY SECTOR MARKETS

VI TRANSPORTATION INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- Airlines have over 50% of the revenues in this sector, as shown in Exhibit VI-1.

- Over half of the industry revenues were derived by the "Fortune 50" transportation companies which include 16 airlines, 16 railroads, 14 motor freight companies, and four water transportation companies.

  - The widely different structures of these subsectors have retarded cross-subsector applications developemnt.

  - The rate structures, particularly in the trucking industry, are extremely complex and have not been automated to their full potential.

- The railroads and pipeline companies typically use their rights of way to carry communications systems.

  - Southern Pacific, through Southern Pacific Communications Company (SPCC), is one example.

  - SPCC functions as a Value Added Network (VAN), selling voice, data, and facsimile services.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VI-1

TRANSPORTATION INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	OPERATING REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$39.5 BILLION 115,859 2.1 MILLION
41	LOCAL AND SUBURBAN TRANSIT	OPERATING REVENUES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$5.7 BILLION 13,328 303,919
42	MOTOR FREIGHT	OPERATING REVENUES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$9.7 BILLION 74,636 1.1 MILLION
44	WATER TRANS-PORTATION	OPERATING REVENUES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$946.0 MILLION 6,048 186,129
45	AIR TRANS-PORTATION	OPERATING REVENUES (1977) NUMBER OF AIR CARRIERS (1976) NUMBER OF EMPLOYEES (1976)	$19.9 BILLION 5,055 339,979
46	PIPELINES	OPERATING REVENUES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$1.9 BILLION 434 14,134
47	TRANS-PORTATION SERVICES	OPERATING REVENUES (1972) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$1.4 BILLION 16,358 144,081

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The 1979 computer services market in the transportation sector is one of the smaller markets, totalling only 2.5% of the overall market. Detailed forecasts for the sector are presented in Exhibit VI-2.

- Batch will grow at the overall industry average of 8%, but the growth will be in general business applications such as payroll in the motor freight sector and in industry specific applications particularly related to billing activities.

- Software products is the most rapidly growing mode, at 38% annually through 1984.

  - Systems software is growing at 40%, reflecting the emphasis placed on improving system utilization, as well as the overall growth in computer usage.

  - Applications software is growing at 35%, well over the overall industry average of 26%. This is indicative of the expanded computer usage in this industry.

- Professional services will grow at 28% which is 50% higher than the overall industry average. This growth is stimulated by additional computer usage combined with the lack of enough suitable software products available to this sector.

- With regard to types of service, industry specialty is the largest and fastest growing.

  - Airlines account for 60%, motor freight 30%, and railroads less than 10%.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VI-2

COMPUTER SERVICES MARKET FORECAST -
TRANSPORTATION SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 9	$ 11	20%	$ 14	$ 17	$ 20	$ 24	$ 28	21%
	SCI. & ENG.	3	3	11	3	4	4	5	5	11
	IND. SPEC.	40	50	25	62	78	97	121	151	25
	UTILITY	22	27	22	32	37	42	47	52	14
SUBTOTAL		74	91	23	111	136	163	197	236	21
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	25	30	20	34	38	42	46	50	11
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		25	30	20	34	38	42	46	50	11
BATCH	GEN. BUS.	16	18	15	20	22	24	26	28	9
	SCI. & ENG.	2	2	0	2	2	2	2	2	0
	IND. SPEC.	16	18	13	20	23	26	28	30	11
	UTILITY	7	7	0	7	7	7	7	7	0
SUBTOTAL		41	45	10	49	54	59	63	67	8
TOTAL PROCESSING	GEN. BUS.	25	29	16	34	39	44	50	56	14
	SCI. & ENG.	5	5	7	5	6	6	7	7	7
	IND. SPEC.	81	98	21	116	139	165	195	231	19
	UTILITY	29	34	17	39	44	49	54	59	12
TOTAL		$ 140	$ 166	19%	$ 194	$ 228	$ 264	$ 306	$ 353	16%
SOFTWARE PRODUCTS	SYSTEM	$ 25	$ 34	36%	$ 48	$ 67	$ 93	$ 131	$ 183	40%
	APPLICATION	15	20	33	27	36	49	66	91	35
TOTAL		$ 40	$ 54	35%	$ 75	$ 103	$ 142	$ 197	$ 274	38%
PROFESSIONAL SERVICES		28	33	18	42	54	69	89	115	28
GRAND TOTAL		$ 208	$ 253	22%	$ 311	$ 385	$ 475	$ 592	$ 742	24%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Key applications are freight billing, vehicle scheduling, and vehicle acquisition analysis.

C. EDP USAGE

- INPUT's 1979 user panel includes 12 EDP managers in the transportation industry. Their responses to a detailed questionnaire are the basis for this section.

- EDP managers purchased over 30% more outside services in 1978 than the overall industry average. Purchase of outside services between 1978 and 1979 is estimated by EDP managers to increase 27%, as shown in Exhibit VI-3.

D. VENDOR ACTIVITIES

- Automated Quill announced a new trucking software package for handling freight billing, bills of lading, reporting, and accounting. The software operates on a Data General computer.

- Distribution Sciences has developed two very important systems to serve the transportation industry.

  - AUTORATE determines the price or rate of a shipment based on bill of lading information.

  - AUTOROUTE determines the most cost effective mode of delivery as well as the carrier consistent within a set of specifications on equipment size and existing carrier loading.

- Univac is selling a software package which tracks railroad cars.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VI-3

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE TRANSPORTATION SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$0-1,071	$ 483	$ 0-976	$ 394	(18%)	(24%)
REMOTE BATCH	-	-	-	-	-	-
BATCH	-	-	-	-	-	-
INPUT/OUTPUT	0-500	136	0-600	166	22	40
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-500	113	0-750	135	19	37
APPLICATIONS SOFTWARE	0-108	44	0-43	30	(35)	0
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-316	185	0-1,266	336	82	2
EDP CONSULTING	0-26	26	0-75	55	111	10
EDUCATION	0-93	25	0-100	40	60	30
OTHER	0-7	4	0-435	N/A	N/A	N/A
FACILITIES MANAGEMENT	-	-	-	-	-	-
MAINTENANCE						
HARDWARE	0-2957	642	0-3635	752	17	(11)
SOFTWARE	0-300	90	0-350	105	17	10
TOTAL OUTSIDE SERVICES EXPENDITURES	$0-4,552	$ 824	$0-6,536	$ 1,047	27%	0%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The system keeps track of the train that the car is on, where the car is going and what is in the car. Empty cars and locomotives can also be tracked.

- The system runs on a Univac 1100/82. It has been successfully installed by the Atchison, Topeka and Santa Fe Railway, where a $20 million savings was reported by the railway in the first year of operation.

- Sperry Univac offers or plans to offer software packages that cover cargo handling, maintenance and engineering, financial management, and flight operations as additions to its commercial airline computer software systems.

  - The software packages are offered as functions compatible with exisiting Univac airline computer system software or as standalone systems.

  - The first product on the market is the cargo automation package, which is derived from an Air Canada development. The cargo automation package, consisting of 12 modular functions, cost $150,000.

  - Other packages are still in development and are as yet unpriced.

- TDS-Midwest, Inc., offers the Freight Audit Computerized Traffic Statistics (FACTS) service under which TDS can either pay a shipper's bills or monitor the bills as they are paid by the shipper's bank.

  - Basic FACTS services - bill auditing, five basic reports, and payments if desired, cost approximately 60¢ per bill.

  - The FACTS reports provide analysis of the company's overall shipping patterns as well as transportation mode, carrier, product line, and other areas.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

VII UTILITIES INDUSTRY SECTOR MARKETS

VII UTILITIES INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- Over half of the revenues in the utilities industry sector come from the gas and electric subsectors, as shown in Exhibit VII-1.

- Eighty percent of the electric power capacity is privately owned.

  - The industry is more dispersed than is generally known, with the "Fortune 50" companies accounting for only 60% of total revenues.

  - The National Rural Electric Cooperative Association represents 1,000 small electrical utilities.

  - The Electric Power Research Institute in Palo Alto, California, does R&D on behalf of the industry.

- The telephone subsector is dominated by AT&T, with over 20 operating companies.

- There is a merging between cable TV in the broadcasting subsector and the telephone companies, since both have the capability to deliver voice, image, and data messages.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VII-1

UTILITIES INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	OPERATING REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 37,137 1.8 MILLION
481	TELEPHONE COMMUNI-CATIONS	OPERATING REVENUES (1977) NUMBER OF COMPANIES (1976) NUMBER OF EMPLOYEES (1976)	$40.8 BILLION 13,753 930,000
482	TELEGRAPH COMPANIES	OPERATING REVENUES (1977) NUMBER OF COMPANIES (1976) NUMBER OF EMPLOYEES (1976)	$951.7 MILLION 1,225 13,324
483	RADIO AND TV BROAD-CASTING	OPERATING REVENUES (1976) NUMBER OF STATIONS (1976) NUMBER OF EMPLOYEES (1976)	$6.8 BILLION 5,743 147,577
489	COMMUNI-CATIONS SERVICES (N.E.C.)	OPERATING REVENUES (1974) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$1.0 BILLION 2,555 37,326
491	ELECTRIC SERVICES	OPERATING REVENUES (1978) NUMBER OF PLANTS (1976) NUMBER OF EMPLOYEES (1976)	$69.9 BILLION 4,082 330,743
492	GAS PRODUCTS AND SERVICES	OPERATING REVENUES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$32.0 BILLION 2,414 123,793
493	COMBINED GAS AND ELECTRIC	OPERATING REVENUES (1974) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$1.9 BILLION 939 143,565
494	WATER SUPPLY	OPERATING REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 2,963 19,649

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VII-1 (CONT.)

UTILITIES INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
495	SANITARY SERVICES	OPERATING REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 3,054 33,667
496	STEAM SUPPLY	OPERATING REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 60 2,929
497	IRRIGATION SYSTEMS	OPERATING REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 349 1,831

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The industry is unique in that almost all participants are:

  - Heavily regulated, with regulation increasing in the "energy" sector.

  - Geographically based, in that almost all participants are limited by regulation as to the areas they are allowed to cover.

  - Limited in the products/services they can offer.

  - Strongly influenced by accounting principles which are used to set rates, depreciate equipment, and justify return on investment.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The dominant characteristic of services markets in the utilities industry is the high percentage of RCS (77% of total processing services in 1977). This percentage will increase to 85% in 1984, as shown in Exhibit VII-2.

- Other than RCS, the markets available for processing services are small. The batch market will increase only 2% through the forecast period.

- Software products are forecast to grow faster than the total industry rate of 30%, but from a small base. This reflects the need of utilities to contain costs: standard software products are less expensive than custom tailored solutions.

  - Sales will increase, as the large central EDP departments - which are typical of this sector - increase their use of systems and applications packages.

- With regard to types of processing services, general business processing services are minor, since most of this processing is done in-house.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VII-2

COMPUTER SERVICES MARKET FORECAST -
UTILITIES SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 10	$ 12	20%	$ 16	$ 20	$ 24	$ 28	$ 32	22%
	SCI. & ENG.	45	51	14	58	66	76	86	98	14
	IND. SPEC.	42	53	25	68	76	96	121	151	23
	UTILITY	75	86	14	97	108	119	130	142	11
SUBTOTAL		172	202	17	239	270	315	365	423	16
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	2	2	0	2	2	2	2	2	0
	IND. SPEC.	-	-	-	-	-	-	-	-	-
	UTILITY	5	6	20	7	9	11	12	13	17
SUBTOTAL		7	8	14	9	11	13	14	15	13
BATCH	GEN. BUS.	10	11	10	12	13	14	15	16	8
	SCI. & ENG.	18	18	0	18	18	18	18	18	0
	IND. SPEC.	8	10	20	10	11	11	11	12	4
	UTILITY	14	15	7	15	15	15	15	15	0
SUBTOTAL		50	54	8	55	57	58	59	61	2
TOTAL PROCESSING	GEN. BUS.	20	23	15	28	33	38	43	48	16
	SCI. & ENG.	65	71	9	78	86	96	106	118	11
	IND. SPEC.	50	63	25	78	87	107	132	163	21
	UTILITY	94	107	14	119	132	145	157	170	10
TOTAL		$ 229	$ 264	15%	$ 303	$ 338	$ 386	$ 438	$ 499	14%
SOFTWARE PRODUCTS	SYSTEM	$ 31	$ 41	32%	$ 55	$ 73	$ 96	$ 128	$ 171	33%
	APPLICATION	10	13	30	18	25	34	47	65	38
TOTAL		$ 41	$ 54	31%	$ 73	$ 98	$ 130	$ 175	$ 236	35%
PROFESSIONAL SERVICES		66	78	18	92	109	128	151	178	18
GRAND TOTAL		$ 336	$ 396	18%	$ 468	$ 545	$ 644	$ 764	$ 913	18%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Scientific and engineering processing services, currently significant, will grow at an average rate of 11%.

- Industry specialty will grow most rapidly, following the trend in other sectors.

C. EDP USAGE

- INPUT's 1979 user panel includes 24 EDP managers in the utility industry sector. Their responses to a detailed questionnaire are the basis for this section.

- EDP managers purchased 100% more outside services in 1978 than the overall industry average.

  - Remote batch processing, contract programming, EDP consulting, education, and hardware maintenance are the major categories in which utility companies spend more than do most other industries.

  - The purchase of outside services between 1978 and 1979 is estimated by EDP managers to increase 28%, as shown in Exhibit VII-3.

D. VENDOR ACTIVITIES

- MDC Systems offers the Capital Project Management System, a computerized management tool now used by Delmarva Power and Light Company on an IBM 3031 processor.

  - The system is used to monitor and coordinate construction of power-generating plants, substations, and transmission lines.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VII-3

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE UTILITY SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$0-190	$ 26	$ 0-200	$ 29	13%	(1%)
REMOTE BATCH	0-271	29	0-450	40	40	-
BATCH	0	-	0-132	7	-	-
INPUT/OUTPUT	0-100	13	0-250	22	69	(4)
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-89	13	0-289	61	359	32
APPLICATIONS SOFTWARE	0-92	10	0-332	45	370	11
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-680	84	0-400	62	(26)	9
EDP CONSULTING	0-250	31	0-200	39	23	-
EDUCATION	0-165	33	0-200	27	(21)	9
OTHER	0-780	42	0-653	34	(17)	1
FACILITIES MANAGEMENT	0-32	2	0-54	3	68	1
MAINTENANCE						
HARDWARE	0-500	85	0-495	110	30	3
SOFTWARE	0-34	5	0-96	8	74	4
TOTAL OUTSIDE SERVICES EXPENDITURES	$0-2,303	$403	$0-3,199	$ 514	28%	5%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- NCR Corporation offers the Interactive Utility Billing System for either city-owned or investor-owned utility operations.

  - The package can handle up to 16,000 accounts involving water, sewer, and garbage services.

  - This is the first system to bring the advantages of interactive direct processing to the small to medium-size utility.

  - The software package is available for a one-time charge of $4,000. It runs on an NCR I-8230 computer.

- Informatics has developed a data base supported system for gathering, analyzing, and modeling utility related information.

  - Model 204 data base system and reporting language was used to develop the application.

  - The system is currently being used by several utilities to forecast environmental scenarios of the future.

- American Science and Engineering has developed a utility meter monitoring system that remotely measures electricity usage. The system can check individual meters as frequently as every 30 minutes or as infrequently as once a month.

- Zytron has developed a turnkey system for electric power plant management.

  - The system provides information for planning, scheduling, resource allocation, plant operations, equipment maintenance, and research and analysis.

  - The hardware is a National CSS 3200.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The software was developed using NOMAD, National CSS's data base management system.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

VIII BANKING AND FINANCE INDUSTRY SECTOR MARKETS

VIII BANKING AND FINANCE INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- As shown in Exhibit VIII-1, banks (SIC code 60), with total 1978 assets exceeding $1,500 billion, are by far the largest segment of the banking and finance industry sector.

- Although, as a group banks spend in excess of 8% of total expenses (net of interest) on automation, they are still very labor intensive, employing over 1.2 million people, or over 44% of total sector employment.

- INPUT has divided the banking and finance sector into seven subsectors:

  - Commercial Banking.
  - Savings and Loan Associations.
  - Credit Unions.
  - Finance Companies.
  - Security and Commodity Brokers.
  - Mortgage Banking Firms.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-1

BANKING AND FINANCE INDUSTRY SECTOR - DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	211,747 2.7 MILLION
60	BANKS	NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	40,943 1.2 MILLION
601	FEDERAL RESERVE BANKS	ASSETS (1978) NUMBER OF BANKS (1976) NUMBER OF EMPLOYEES (1976)	$153.2 BILLION 54 26,238
602	COMMERCIAL BANKS	ASSETS (1978) DEPOSITS (1978) NUMBER OF BANKS (1978) NUMBER OF EMPLOYEES (1976)	$1,425 BILLION $1,212 BILLION 15,296 1.2 MILLION
603	MUTUAL SAVINGS BANKS	ASSETS (1976) DEPOSITS (1976) NUMBER OF BANKS (1976) NUMBER OF EMPLOYEES (1976)	$134.8 BILLION $123.7 BILLION 1,815 44,440
604/605	TRUST COMPANIES AND OTHER FUNCTIONS	ASSETS NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 1,582 24,706
61	CREDIT AGENCIES	ASSETS (1978) NUMBER OF COMPANIES (1978) NUMBER OF EMPLOYEES (1978)	$116.5 BILLION 3,160 459,433
611	REDISCOUNT AND FINANCING INSTITUTIONS	ASSETS NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 68 1,659
612	SAVINGS AND LOAN ASSOCIATIONS	ASSETS (1978) NUMBER OF ASSOCIATIONS (1978) NUMBER OF EMPLOYEES (1976)	$ 509 BILLION 4,770 171,187

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-1(CONT.)

BANKING AND FINANCE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
613	AGRICULTURAL CREDIT INSTITUTIONS	ASSETS NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 1,269 12,398
614	CREDIT UNIONS	ASSETS (1978) NUMBER OF CREDIT UNIONS (1978) NUMBER OF EMPLOYEES (1976)	$61.0 BILLION 22,500 191,541
615	BUSINESS CREDIT INSTITUTIONS	ASSETS NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 1,750 33,999
616	MORTGAGE BANKERS AND BROKERS	VALUE OF MORTGAGES SERVICED(1978) NUMBER OF FIRMS (1978) NUMBER OF EMPLOYEES (1976)	$194 BILLION 900 46,523
62	SECURITY AND COMMODITY BROKERS	TOTAL CAPITALIZATION (1978) NUMBER OF COMPANIES (1978) NUMBER OF EMPLOYEES (1976)	$4.2 BILLION 465 173,548
67	HOLDING AND OTHER INVESTMENT COMPANIES	NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	12,059 153,862

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Other.

- The types of firms included in each subsector according to their Standard Industrial Classification (SIC) are shown in Exhibit VIII-2.

- The banking and finance market is characterized in most subsectors by a concentration of assets in "very large" and "large" firms.

  - Very large commercial banks (deposits exceeding $1 billion): less than 1% of the total number (15,296) hold both over 50% of total bank deposits and over 75% of total trust assets.

  - Very large and large credit unions (assets exceeding $5 million): only 8% of the total number (22,500) hold 85% of total industry assets.

  - Very large finance companies (credit outstanding exceeding $100 million): only 3% of total finance companies (3,160) hold 90% of both industry assets and credit outstanding.

  - Very large security and commodity firms (capitalization exceeding $50 million): 5% of total firms (465) hold 70% of total industry capitalization.

- Concentration of assets is more moderate in two subsectors.

  - Very large and large savings and loan associations (assets exceeding $100 million): 20% of total S&Ls (4,770), hold 77% of total industry assets.

  - Very large and large mortgage banking firms (servicing portfolio exceeding $400 million): 12% of total firms (900) hold 66% of total mortgage servicing loan value.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-2

STANDARD INDUSTRIAL CLASSIFICATION (SIC) INDUSTRIES INCLUDED IN BANKING AND FINANCE SUBSECTORS

STANDARD INDUSTRIAL CLASSIFICATION			FINANCE AND BANKING SUBSECTORS						
GROUP NUMBER	INDUSTRY NUMBER	INDUSTRY	COMMERCIAL BANK	SAVINGS AND LOAN	CREDIT UNION	FINANCE COMPANY	SECURITY FIRM	MORTGAGE BANKING	OTHER
601	6011	FEDERAL RESERVE BANKS	X						
602	6022-6028	COMMERCIAL AND STOCK SAVINGS BANKS	X						
603	6032-6034	MUTUAL SAVINGS BANKS	X						
604	6042-6044	TRUST COMPANIES NOT ENGAGED IN DEPOSIT BANKING							X
605	6052-6054	ESTABLISHMENTS PERFORMING FUNCTIONS CLOSELY RELATED TO BANKING							X
	6055	CLEARING ASSOCIATIONS	X						
	6056-6059	OTHER CLOSELY RELATED TO BANKING							X
611	6112-6113	REDISCOUNT INSTITUTIONS FOR CREDIT AGENCIES OTHER THAN BANKS							X

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-2 (CONT.)

STANDARD INDUSTRIAL CLASSIFICATION (SIC) INDUSTRIES INCLUDED IN BANKING AND FINANCE SUBSECTORS

STANDARD INDUSTRIAL CLASSIFICATION			FINANCE AND BANKING SUBSECTORS						
GROUP NUMBER	INDUSTRY NUMBER	INDUSTRY	COMMERCIAL BANK	SAVINGS AND LOAN	CREDIT UNION	FINANCE COMPANY	SECURITY FIRM	MORTGAGE BANKING	OTHER
612	6122-6125	SAVINGS AND LOAN ASSOCIATIONS		X					
613	6131	AGRICULTURAL CREDIT INSTITUTIONS							X
614		PERSONAL CREDIT INSTITUTIONS							
	6142-6143	CREDIT UNIONS			X				
	6144-6149	PERSONAL FINANCE COMPANIES				X			
615	6153-6159	BUSINESS CREDIT INSTITUTIONS				X			
616		MORTGAGE BANKERS AND BROKERS							
	6162	MORTGAGE BANKERS						X	
	6163	LOAN BROKERS							X
621	6211	SECURITY BROKERS AND DEALERS					X		

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-2 (CONT.)

STANDARD INDUSTRIAL CLASSIFICATION (SIC) INDUSTRIES INCLUDED IN BANKING AND FINANCING SUBSECTORS

STANDARD INDUSTRIAL CLASSIFICATION			FINANCE AND BANKING SUBSECTORS						
GROUP NUMBER	INDUSTRY NUMBER	INDUSTRY	COMMERCIAL BANK	SAVINGS AND LOAN	CREDIT UNION	FINANCE COMPANY	SECURITY FIRM	MORTGAGE BANKING	OTHER
622	6221	COMMODITY BROKERS AND DEALERS					X		
623	6231	SECURITY AND COMMODITY EXCHANGES					X		
628	6281	SERVICES ALLIED WITH EXCHANGES					X		
671	6711	HOLDING COMPANIES							X
672	6722-6725	INVESTMENT COMPANIES							X
673	6732-6733	TRUSTS							X
679	6792-6799	MISCELLANEOUS INVESTING							X

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- There is every indication that industry consolidation through acquisition, merger, and liquidation is continuing.

  - The total number of commercial banks is nearly constant (0.8% average annual growth rate or AAGR), but very large banks are growing in number at 9.5% AAGR.

  - The total number of S&Ls is declining. However, very large S&Ls have an 8% AAGR.

  - The total number of credit unions is also declining, but very large credit unions are experiencing a 13% AAGR.

  - The total number of finance companies has a 2.3% average annual decline rate. However, very large finance companies have a 7% AAGR.

  - Very large security and commodity firms are growing at a 6% AAGR in the face of a decline in the total number of firms.

  - Very large mortgage banking firms, growing in number at 14% AAGR, are outpacing industry growth of 2% AAGR.

- Changes in state banking laws offer new opportunities for computer services vendors.

  - Ohio shifted to county wide branching in 1980 with unrestricted statewide branching in 1989.

- Successful marketing does not necessarily mean targeting computer services to very large firms.

  - Small and medium-size banks hold 35% of commercial accounts and are prime candidates of correspondent bank processing services.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The middle market for trust services: small banks with trust assets over $10 million to large banks with trust assets up to $800 million, hold 58% of total trust accounts.

- Very large S&Ls hold only 13% of total savings accounts. Small to large S&Ls are relatively small organizations and turn to computer services vendors for most of their processing needs.

- Small to large credit unions hold nearly 70% of total share accounts and are predominantly computer services oriented.

- Further details on banking and finance sector characteristics are found in INPUT's Industry Report "Computer Services Markets in Banking and Finance " July 1979.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The market for computer services in the banking and finance sector is excellent. In 1978, these firms spent over $1.6 billion on computer processing, software products, and professional services. With an AAGR exceeding 16% over the next six years, the financial community's total computer services expenditures will rise to nearly $4 billion in 1984.

- Firms spend, on the average, 30% of total EDP budgets on computer services, and the portion will increase to 36% by 1984.

- As shown in Exhibit VIII-3, commercial banking is the largest subsector, garnering 62% of total computer services revenues. With an AAGR of 17%, computer services revenues will increase nearly $1.6 billion annually by 1984.

- Buoyed by their new consumer lending powers, credit unions are the largest growth area (18% AAGR).

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-3

COMPUTER SERVICES MARKET FORECAST FOR BANKING AND FINANCE BY INDUSTRY SUBSECTOR 1978-1984

INDUSTRY SUBSECTOR	USER EXPENDITURES								
	1978 ($ MILLION)	1979 ($ MILLION)	GROWTH 1978/1977 (PERCENT)	1980 ($ MILLION)	1981 ($ MILLION)	1982 ($ MILLION)	1983 ($ MILLION)	1984 ($ MILLION)	AAGR 1979-1984 (PERCENT)
COMMERCIAL BANKING	$ 1,033	$ 1,210	17%	$ 1,411	$ 1,646	$ 1,918	$ 2,236	$ 2,603	17%
SAVINGS AND LOAN	158	182	15	209	239	274	314	362	15
CREDIT UNION	77	91	18	107	126	148	174	205	18
FINANCE COMPANY	53	59	12	67	75	84	94	107	12
SECURITY AND COMMODITY BROKERS	225	252	12	283	318	355	400	450	12
MORTGAGE BANKING COMPANY	22	25	17	29	35	41	48	57	17
OTHER	76	88	16	102	118	137	159	185	16
TOTAL	$ 1,644	$ 1,907	16%	$ 2,208	$ 2,557	$ 2,957	$ 3,425	$ 3,969	16%

©1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Finance companies, faced with a declining consumer market share and pressed by both credit cards and by credit union competition, will have below average growth.

- With excess internal capacity favoring shifting to in-house operations, and with market saturation in selected application areas, security and commodity firms also will have below average overall growth in computer services. However, excellent opportunities for new RCS and FM computer services exist in selected areas.

- Mortgage banking companies, a specialized market area, will have above average growth, as smaller companies automate and large companies increase their level of automation.

- Service delivery mode, as shown in Exhibit VIII-4 - now equally divided between RCS and batch, with FM at 15% - will shift to RCS dominance at 57% of total servicing expenditures by 1984.

- There is a singificant market for software products, which is expected to reach nearly one-half billion dollars annually by 1984. This is a market related to applications implemented using DBMS.

C. EDP USAGE

- Banking and finance firms are highly automated. The degree of automation is the highest of any of the 14 industry sectors.

- Respondent data for banks indicate that nearly 80% of all EDP budgets fall between 0.1-0.4% of bank assets, or 7.6-8.2% of total bank operating expenses (net of interest expenses).

- Banking and finance firms are excellent markets for computer services.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-4

COMPUTER SERVICES MARKET FORECAST - BANKING AND FINANCE SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 85	$ 105	24%	$ 128	$ 155	$ 185	$ 223	$ 266	21%
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	439	540	23	665	821	1,005	1,228	1,501	23
	UTILITY	39	44	13	50	56	63	71	82	13
SUBTOTAL		563	689	22	843	1,032	1,253	1,522	1,849	22
FACILITIES MANAGEMENT	GEN. BUS.	–	–	–	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	197	233	18	274	321	376	439	512	17
	UTILITY	–	–	–	–	–	–	–	–	–
SUBTOTAL		197	233	18	274	321	376	439	512	17
BATCH	GEN. BUS.	121	134	11	146	160	174	190	206	9
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	432	468	8	507	542	581	619	656	7
	UTILITY	7	7	7	8	9	10	11	13	11
SUBTOTAL		560	609	9	661	711	765	820	875	8
TOTAL PROCESSING	GEN. BUS.	206	239	15	274	315	359	413	472	15
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	1,068	1,241	16	1,446	1,684	1,962	2,286	2,669	16
	UTILITY	46	51	13	58	65	73	82	95	13
TOTAL		$1,320	$ 1,531	16%	$1,778	$2,064	$2,394	$2,781	$3,236	16%
SOFTWARE PRODUCTS	SYSTEM	$ 55	$ 62	13%	$ 70	$ 80	$ 91	$ 104	$ 118	14%
	APPLICATION	161	187	16	214	245	279	318	361	14
TOTAL		$ 216	$ 249	15%	$ 284	$ 325	$ 370	$ 422	$ 479	14%
PROFESSIONAL SERVICES		108	127	18	146	168	193	222	254	15
GRAND TOTAL		$1,644	$ 1,907	16%	$2,208	$2,557	$2,957	$3,425	$3,969	16%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Commercial banks spend nearly 25% of total EDP budget on computer services.

- S&Ls spend about one-third of total EDP budget on computer services.

- Credit unions expenditures for computer services exceed 60% of total EDP budget; only very large credit unions tend to have in-house EDP.

- Computer services represent 30% of total finance company budgets.

- Security and commodity brokers spend nearly 40% of total EDP budget on software products and processing services.

- Expenditures for computer services are 35% of total EDP budget for mortgage banking firms.

- Average expenditures for outside services by EDP managers are shown in Exhibit VIII-5.

D. VENDOR ACTIVITIES

- In addition to reporting vendor activity in banking and finance industry subsectors related to applications special to each subsector, vendor activity is also reported in selected areas of high growth and activity.

1. ACQUISITIONS

- Acquisitions continue to play a significant role in market entry and expansion in the banking and finance sector.

- Tymshare acquired the EFT switch developed by the Savings Association Central Corporation (SACC) and will offer through Timeshare Funds Transfer

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT VIII-5

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE BANKING AND FINANCE SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$0-400	$22	$ 0-600	$32	46%	-
REMOTE BATCH	0-25	1	0-50	1	100	-
BATCH	-	-	-	-	-	-
INPUT/OUTPUT	0-97	10	0-100	13	32	(6)
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-175	17	0-150	24	45	16
APPLICATIONS SOFTWARE	0-150	20	0-150	20	2	6
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-520	22	0-80	7	(66)	3
EDP CONSULTING	0-70	8	0-30	2	(77)	1
EDUCATION	0-86	9	0-95	12	38	11
OTHER	0-77	2	0-62	2	0	(2)
FACILITIES MANAGEMENT	-	-	0-1,250	23	N/A	-
MAINTENANCE						
HARDWARE	0-200	46	0-300	48	5	2
SOFTWARE	0-12	1	0-36	2	75	2
TOTAL OUTSIDE SERVICES EXPENDITURES	$0-656	$160	$0-1,281	$201	26%	1%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

Services, Inc. (TFTS) independent third party ATM services to S&Ls and other financial institutions in California.

- Tymshare also has acquired the Validata credit card and check verification service from TRW.

- H & R Block, in a move to shift its tax data processing from other RCS vendors, plans to acquire COMPUSERVE.

- Anacomp, Inc. is actively acquiring credit union account processors:

  - Computer Services Corporation, a Michigan firm, in 1978.

  - Access Data Systems, an Arizona firm, in 1979.

  - ERCO, Inc. from CUBE, Inc., in 1979.

- On-Line Systems, itself acquired by United Telecommunications, in turn acquired Dynabank, an Atlanta-based financial data processing services firm jointly owned by three money center banks. OLS has had a FM contract with Dynabank for many years.

- Automatic Data Processing (ADP) acquired the correspondent bank processing operation of WINTERS National Bank in Ohio.

- Anacomp acquired the correspondent bank data services of United Virginia Bank.

- Control Data Corporation purchased the electronic trading system for the Cincinnati Stock Exchange from Weeden Holding Company. The system is the prototype for development of a National Marketing System.

- Computer Sciences Corporation (CSC) acquired both the Commercial Bank Data Processing and Professional Services Divisions of Itel.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

2. INDUSTRY SPECIALITY

- Tymshare is marketing the Integrated Banking System (IBS), a 13 mainline applications software package for commercial banks using Burroughs mainframes.

- Bunker Ramo, FM manager of the NASDAQ network, is the leading vendor of financial inquiry services to brokerage houses.

- Bradford National Corporation specializes in both back office processing and in securities clearance for Wall Street.

- Computer Power, Inc. (CPI) the leading vendor of RCS services to mortgage bankers has developed a distributed system using the Raytheon PTS 1200 user site minicomputer remotely connected to the host.

- Service Bureau Company (SBC), the leading commercial RCS vendor for credit unions, besides offering batch, remote batch, and on-line services (FOCUS), is looking at an USHS minicomputers.

- SEI, Inc., and Brandford National have over 35% of the market for personal trust computer services. Comshare is making a strong bid to increase its market share.

- ADP is the leading vendor of payroll and other business services to commercial banks, both on a private label and direct processing basis.

- Remote Computing Corporation (RCC), the leading vendor of RCS services to S&Ls for financial planning (SLP), is extending its services to mutual savings banks (MLP).

- Action Data Services, a subsidiary of Service Bureau Company, is the leading computer services vendor for finance companies. In addition to on-line processing, it uses its RCS network for finance company branch data collection and transmission to finance company in-house hosts.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Financial Network Architects, Inc. offers a realtime transaction processing system for S&L mainline applications. The VISION system combines General Automation and other OEM hardware with software developed for Home Federal Saving and Loan of San Diego.

- Boeing Computer Services, Inc. (BCS), is establishing data collection centers at five locations, including Chicago, to offer mainline processing services to commercial banks. Centers include a HP 3000, a Cummins-Allison Corporation 6400 capture/print system and are tied into the RCS network to large scale IBM mainframes.

- University Computing Company (UCC) released a new installment loan system (UCC/ILS) designed to process all types of consumer lending.

- NCR announced Variable Item Processing System (VIPS) software to handle improved check processing using the model 6780 reader/sorter.

3. FINANCIAL SERVICES

- Monchik-Weber introduced a realtime RCS service for option monitoring for professional investors and traders who use stock options as financial instruments.

- Rapidata offered on-line access to Bonds, a Telstat Systems, Inc. data base containing weekly bid, offer, and closing price information on over 6,000 bonds traded over-the-counter.

- TMI Systems Corporation has installed a DEC minicomputer based automated letter of credit system at the First National Bank of Boston.

- Collins Commercial Telelcommunications Group is producing a turnkey system that integrates message communications between Fedwire, Bankwire II, CHIPS, and SWIFT bank networks.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Commercial banks are offering enhanced cash management services to corporate customers.

  - Harris Banks offers "Cash Manager" through Bank Link, an interbank cash reporting and information network.

  - Chemical Bank's, Chemlink network inteconnects over 400 banks to over 300 corporate users.

- National Data Corporation introduced its enhanced Automated Cash Control Program. The new system, first used by American Express, links the using company with participating banks on NDC's Data Exchange.

4. CREDIT/DEBIT CARDS

- Having acquired the credit card operations of Western States Bankcard Association (WSBA), Tymshare is extending marketing of credit processing services to the Northwest and Southwest through its subsidiary, Tymshare Transaction Services, Inc.

- First Data Resources, the leading commercial credit card processor, has airline credit card processing contracts with United, Continental and Western Airlines in addition to having FM contracts to provide credit card processing for the Mid American Bankcard Association (Omaha), Southeast Bankcard Association (Atlanta) and the Mountain States Bankcard Association (Denver).

- National Data Corporation offers a Visa card program to S&L's whereby credit charges are reduced to 1% for accounts pledged by a savings account or certificate.

- Visa, Inc. added both debit card and travel checks to its services offerings.

  - The debit card service enables Chase Manhattan Bank to deduct the cost of purchases directly from a checking account.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

5. ELECTRONIC FUNDS TRANSFER/AUTOMATED TELLER MACHINE (EFTS/ATM)

- 1979 saw a flood of financial institutions across the country planning to install or installing ATM networks.

  - United California Bank will have 80 installed by year end.

  - Crocker National Bank had 85 ATMs planned by 1980.

  - A consortium of smaller banks headed by City National Bank of Beverly Hills, plans for over 100 installations by mid 1980.

  - Bank of America has installed over 30 ATMs in the Santa Clara Valley and has ordered 400 more from Diebold, Inc.

  - Phildelphia National Bank announced the Money Access Center (MAC), a shared ATM network, initially for 13 banks in Pennsylvania.

- The U.S., with over 2,700 installed ATMs in 1979 (nearly 40% of the worldwide ATM installations), will have over 125,000 by 1985 or 51% of the then worldwide installed base.

- Wells Fargo is planning to install over 1,000 Datatrol FT-3204 transaction authorization terminals as part of its Well Service to retailers for authorization of bank credit and sales.

- National Sharedata integrated its Sharedata On-Line Information System (SOLIS) at Merchants National Bank (Kansas) with the banks' ZIP ATM network and Capitol Federal Savings and Loan's Money-Matic POS network, to develop a shared consumer EFTS system.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- National Data Corporation (NDC) is acting as agent for its bank clients in processing interregional Automated Clearing House (ACH) transactions to the Atlanta Federal Reserve Bank.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

IX INSURANCE INDUSTRY SECTOR MARKETS

IX INSURANCE INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- As shown in Exhibit IX-1, net premium income (total income less investment income), the best indicator of daily business activity in the insurance industry, was nearly equally divided in 1978; almost $80 billion for life/health insurance companies, and nearly $82 billion for property/casualty insurance companies.

- The insurance sector, while highly automated, is still very labor intensive - employing nearly 1.7 million people in 1977. Company employment exceeds that of partnerships, agencies, and individual brokers by a factor of 4.6. None the less, insurance agents and brokers represent a significant market area for new computer services.

- INPUT has divided the insurance sector into five subsectors:

  - Life/health Insurance.
  - Property/casualty Insurance.
  - Government Funded Health Insurance.
  - Insurance Agents and Brokers.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IX-1

INSURANCE INDUSTRY SECTOR - DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	29,814 1.7 MILLION
631	LIFE INSURANCE	PREMIUM RECEIPTS (1978) NUMBER OF CORPORATE GROUPS(1978) NUMBER OF ESTABLISHMENTS(1976) NUMBER OF EMPLOYEES (1977)	$47.6 BILLION 1,200 15,732 518,700
632	MEDICAL AND HEALTH INSURANCE	PREMIUM RECEIPTS (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	$32.1 BILLION 1,426 110,000
633	FIRE, MARINE AND CASUALTY INSURANCE	PREMIUMS RECEIPTS (1978) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF CORPORATE GROUPS(1978) NUMBER OF EMPLOYEES (1977)	$81.8 BILLION 6,860 800 597,500
635	SURETY INSURANCE	PREMIUMS WRITTEN (1977) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	$660 MILLION 426 6,000
636	TITLE INSURANCE	PREMIUMS WRITTEN (1977) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	- 1,726 33,000
637	PENSION, HEALTH AND WELFARE FUNDS	PREMIUMS WRITTEN-AMOUNT IN FORCE NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	- 3,323 65,000
639	INSURANCE CARRIERS (N.E.C.)	PREMIUMS WRITTEN NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	- 161 5,700
64	INSURANCE AGENTS, BROKERS AND SERVICES	OPERATING REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	- 71,588 365,100

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Other.

- The types of firms included in each subsector according to their Standard Industrial Classification Code (SIC) are shown in Exhibit IX-2.

- The market for insurance companies is composed of some 2,000 corporate groups, each group composed of from one to fifteen companies: 1,200 life/health, and 800 property/casualty groups.

- Financial assets are concentrated in very large and large companies or groups.

  - Very large and large life/health insurance groups (assets exceeding $1 billion), control 78% of total assets.

  - Very large and large property/casualty insurance groups (net premium revenues exceeding $250 million and 7% of total number) hold 80% of total assets.

- In terms of revenues, casualty insurance companies are growing more rapidly, with an AAGR of 13%, than life insurance companies (10% AAGR).

- For further details on insurance company characteristics, see INPUT's Industry Report "Computer Services Market in Insurance Companies." November 1979.

- The major portion (95%) of total 1977 health care expenditures was for personal health care. Governments provided 40% of nearly $154 billion: the federal government 28% or nearly $43 billion, states and local government the remainder.

- Nearly 75% of the federal budget for personal health care is spent for Medicare, Medicaid and CHAMPUS.

  - Nearly 27 million people (about 12% of the population) are enrolled in Medicare. In 1976, about 55% of eligible recipients submitted claims.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IX-2

STANDARD INDUSTRIAL CLASSIFICATION (SIC) INDUSTRIES INCLUDED IN INSURANCE SUBSECTORS

STANDARD INDUSTRIAL CLASSIFICATION			INSURANCE SUBSECTORS				
GROUP NUMBER	INDUSTRY NUMBER	INDUSTRY NAME	LIFE/HEALTH	PROPERTY/ CASUALTY	GOVERNMENT FUNDED HEALTH INSURANCE	OTHER	AGENTS AND BROKERS
631	6311	LIFE INSURANCE	X				
632	6321	ACCIDENT AND HEALTH INSURANCE	X				
	6324	PRIVATE HOSPITAL AND MEDICAL SERVICE PLANS				X	
633	6331	FIRE, MARINE, AND CASUALTY INSURANCE		X			
635	6351	SURETY INSURANCE		X			
636	6361	TITLE INSURANCE		X			
637	6371	PENSION, HEALTH, AND WELFARE FUNDS				X	
639	6399	MISCELLANEOUS INSURANCE CARRIERS				X	
641	6411	INSURANCE AGENTS AND BROKERS					X
–	–	GOVERNMENT FUNDED HEALTH AND WELFARE INSURANCE			X		

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- In 1978, medicaid bills were paid for over 25 million people.

- Administrative and training costs including data processing averaged 4% of total program costs for Medicare and 4.6% for Medicaid.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- Total computer services expenditures in the insurance sector, (nearly $900 million in 1978) will more than double by 1984 for a AAGR of 14%, as shown in Exhibit IX-3.

  - Government funded health insurance includes Medicare, Medicaid and CHAMPUS and is the largest of the five subsectors.

  - Facilities management is the primary delivery mode, accounting for 88% of total computer services expenditures.

  - When implemented, national health insurance will more than double computer services expenditures in this subsector, with some loss in the life/health company subsector.

- The market for computer services to agents and brokers was $160 million in 1978. It will exceed that for life companies by 1980, with a 18% AAGR spurred by accelerated automation, both by minicomputer and on-line telecommunications systems.

- RCS processing services, a relatively low portion (17%) of total computer services expenditures in 1979, are growing most rapidly (18% AAGR) as insurance companies seek on-line realtime solutions which are cost effective relative to rapidly escalating labor costs (see Exhibit IX-4).

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IX-3

COMPUTER SERVICES MARKET FORECAST FOR INSURANCE SECTOR BY INDUSTRY SUBSECTOR

INDUSTRY SUBSECTOR	USER EXPENDITURES								
	1978 ($ MILLION)	1979 ($ MILLION)	GROWTH 1978-1979 (PERCENT)	1980 ($ MILLION)	1981 ($ MILLION)	1982 ($ MILLION)	1983 ($ MILLION)	1984 ($ MILLION)	AAGR 1979-1984 (PERCENT)
LIFE/HEALTH	$ 172	$ 190	11%	$ 210	$ 232	$ 257	$ 284	$ 314	11%
PROPERTY/CASUALTY	122	135	11	150	167	185	205	228	11
GOVERNMENT FUNDED HEALTH INSURANCE	376	430	14	491	561	641	733	837	14
INSURANCE AGENTS AND BROKERS	160	189	18	223	263	310	366	432	18
OTHER	30	34	13	38	43	49	55	66	13
TOTAL	$ 860	$ 978	14%	$1,112	$1,266	$1,442	$1,643	$1,877	14%

©1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IX-4

COMPUTER SERVICES MARKET FORECAST - INSURANCE SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 63	$ 74	17%	$ 86	$ 101	$ 119	$ 141	$ 164	17%
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	62	75	21	91	110	133	160	195	21
	UTILITY	18	20	11	22	25	28	30	33	11
SUBTOTAL		143	169	18	199	236	280	331	392	18
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	362	411	13	465	528	598	676	767	13
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		362	411	13	465	528	598	676	767	13
BATCH	GEN. BUS.	20	22	6	23	24	25	27	29	6
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	54	58	8	63	68	73	79	85	8
	UTILITY	9	9	5	10	10	11	12	13	6
SUBTOTAL		83	89	7	96	102	109	118	127	7
TOTAL PROCESSING	GEN. BUS.	83	95	15	109	125	144	168	193	15
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	478	544	14	619	706	804	915	1,047	14
	UTILITY	27	30	11	32	35	39	42	46	11
TOTAL		$ 588	$ 669	14%	$ 760	$ 866	$ 987	$1,125	$1,286	14%
SOFTWARE PRODUCTS	SYSTEM	$ 51	$ 58	15%	$ 67	$ 77	$ 89	$ 102	$ 118	15%
	APPLICATION	111	128	15	147	168	193	222	254	15
TOTAL		$ 162	$ 186	15%	$ 214	$ 245	$ 282	$ 324	$ 372	15%
PROFESSIONAL SERVICES		110	123	12	138	155	173	194	219	12
GRAND TOTAL		$ 860	$ 978	14%	$1,112	$1,266	$1,442	$1,643	$1,877	14%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The combination of software products and related systems and programming professional services is a major market area with nearly one-third of total 1979 expenditures.

- Because of government funded health insurance, the insurance sector is heavily "specialty" oriented, with over 80% of 1979 total processing expenditures used for industry specialty processing.

C. EDP USAGE

- Insurance companies are highly automated. The degree of automation is probably second only to that of the banking and finance sector.

- Respondent data indicate that life/health insurance companies spent between 1.0% and 2.6% of annual premium revenue on EDP. Average expenditures were 1.5% of total net premiums revenue.

- Property/casualty insurance companies spent somewhat less, between 0.7% and 1.4% of net premium revenue on EDP. Average annual EDP expenditures were 1.0% of net premium revenue.

- EDP is highly centralized in in-house operations. Firms spend, on the average, only 15% of total EDP budgets on computer services. The portion is expected to decline as companies bring timesharing services in-house and use minicomputers to replace RCS specialty applications.

- Average expenditures for outside services by EDP managers are shown in Exhibit IX-5.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT IX-5

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE INSURANCE SECTOR AS REPORTED BY RESPONDENTS

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$ 0-150	$ 7	$ 0-200	$ 8	24%	(4%)
REMOTE BATCH	0-600	11	0-600	11	-	-
BATCH	0-20	0.5	0-20	0.5	-	-
INPUT/OUTPUT	0-150	7	0-125	9	22	2
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-157	18	0-120	22	21	13
APPLICATIONS SOFTWARE	0-100	19	0-500	44	127	24
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-368	23	0-868	39	70	(2)
EDP CONSULTING	0-42	3	0-50	5	103	-
EDUCATION	0-94	10	0-102	13	33	7
OTHER	0-15	-	0-20	-	33	-
FACILITIES MANAGEMENT	0-222	-	0-222	-	-	-
MAINTENANCE						
HARDWARE	0-859	59	0-980	85	44	2
SOFTWARE	0-149	6	0-197	9	38	24
TOTAL OUTSIDE SERVICES EXPENDITURES	$0-1,261	$161	$0-2,241	$267	65%	4%

* SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

D. VENDOR ACTIVITIES

- National CSS has placed at least two user site hardware systems with insurance related firms involved in actuarial analysis and in pension planning and administration.

- Service Bureau Company (SBC) provides mainline application RCS services using the TCC Life/70 package, specialty services to insurance companies for financial and corporate planning, and extensive services to agents and brokers for product marketing.

- Informatics offers the Life-Comm insurance administration system, both as an in-house package and as an RCS service to some 25 insurance companies. Informatics also offers financial and corporate planning and investment planning services.

- TCC, Inc. offers its Life/70 system both on a in-house software and a RCS basis. TCC also offers pension planning and administration services and products.

- Datair Systems Corporation provide specialized pension and estate planning services to insurance companies.

- Information Resources, Inc. provides processing services for credit life insurance.

- EDS provides FM to some 14 life insurance and 8 casualty insurance companies. EDS also supplies processing services and installed its insurance administration system in another 12 life insurance and 8 casualty insurance companies.

- CYBERTEK, Inc. has installed CYPROS software products for mainline processing in over 80 medium to large life insurance companies.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

  - LYCOR has installed its Personalized Life Management System (PALM), Management and Administration of Group Insurance Claims (MAGIC) and Management of Credit (Life) System (MACS) in over 40 companies.

- RAND Information Systems provides RCS services and software products to property/casualty insurance companies and to agents and brokers. Beside agency accounting, RAND provides services for reinsurance, bureau reporting, and accounting.

- ASDC, Inc. (Rhode Island) provides automobile rating, writing, and direct billing services for assigned risk and no fault cases.

- Interstate Business Services (Ohio) provides bureau reporting and general accounting services to property/casualty insurance companies in the greater Ohio/Indiana area.

- Insurance Systems of America (ISA), jointly owned by 15 insurance companies, offers both RCS services and provides an extensive line of software products to both life and casualty insurance companies. ISA has installed its Casualty Information System (CIS) in over 50 companies.

- Policy Management Systems has installed its PMS system in over 100 companies.

- Computer Sciences Corporation (CSC) provides FM to large property/casualty insurers and also markets RCS services jointly with Seibels, Bruce and Company using their Policy Management System (PMS).

- EDS is, by far, the current leading vendor of computer services for government funded health insurance. EDS formed National Heritage Insurance Company to compete with Blue Cross/Blue Shield plans as underwriter and fiscal agent for both Medicaid and Medicare.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Bradford National Corporation has expanded its presence in the marketplace by becoming the Medicaid fiscal agent for the State of New York. Bradford recently acquired Eagles National Life Insurance Company.

- Computer Sciences Corporation (CSC), the Medicaid fiscal intermediary for California, will begin processing Medical hospital claims on December 1, 1979.

- Besides being the Medicaid fiscal agent for Virginia, The Computer Company (TCC) has specialized in developing Medicaid Medical Information Systems (MMIS) on a subcontract basis; for CSC in California, System Development Corporation (SDC) in Florida, and Bradford National in New York.

- Informatics, as subcontractor to Equitable Life Assurance Company, does Medicare (Part B) processing for Tennessee, Idaho and New Mexico.

- Optimum Systems, Inc. (OSI), a Medicare (Part B) processor for Arkansas, Minnesota and Connecticut, also does Professional Standard Review Office (PSRO) processing to uncover potential abuse and fraud in Medicaid claims payments.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

X MEDICAL INDUSTRY SECTOR MARKETS

X MEDICAL INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- The Medical industry is the second largest industry in the U.S: it now accounts for more than 9% of the GNP and its share is growing.

- Total health care expenditures in 1979 will be over $200 billion. Hospitals are the largest sector, accounting for about 50% of these costs, as shown in Exhibit X-1.

- From a base of $39 million in 1965, the projected $200 billion in 1979 is expected to grow at a rate of 11% per year.

- Health care costs continue to increase despite pressures from the federal government to hold them down. However, for the 12 months ending October 1979, wherein the consumer price index has increased 12.2%, the medical care component has only increased 9.4% and the hospital sector 10.9%.

- Health care is a labor intensive industry; particularly so in the hospital sector.

  - As bargaining agreements and inflation force compensation rates up, cost of health care increases.

- Other contributors to increasing health care costs are:

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT X-1

MEDICAL INDUSTRY SECTOR - DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 262,839 4.1 MILLION
801	PHYSICIANS	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$26.4 BILLION 124,122 566,495
802	DENTISTS	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$8.6 BILLION 76,359 252,295
803	OSTEOPATHS	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 4,336 15,354
804	HEALTH PRACTIC-TIONERS, (N.E.C.)	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$2.4 BILLION 22,344 56,169
805	NURSING HOMES	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$10.6 BILLION 11,790 736,309
806	HOSPITALS	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$55.4 BILLION 5,333 2.2 MILLION
807	MEDICAL AND DENTAL LABORATORIES	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 9,459 84,785
808	OUTPATIENT CARE FACILITIES	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 5,419 104,519

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT X-1 (CONT.)

MEDICAL INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
809	HEALTH AND ALLIED SERVICES,(N.E.C.)	HEALTH EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 3,677 74,415

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Improved diagnostic and treatment programs have led to increasing numbers of procedures.

- Increases in malpractice insurance for physicans have led to higher fees and increased numbers of procedures prescribed for defensive purposes.

- State and Federal government regulations, both present and proposed, are of great concern to the industry and will have an effect on the industry use of computers.

  - The Federal government (HEW) is seeking to impose on hospitals a uniform reporting system, System for Hospital Uniform Reporting (SHUR). If implemented, it would result in very large charges on hospitals and vendors.

  - The Hospital Cost Containment Act of 1977 is still being considered by the Congress. If passed, it would limit even further the funds that acute care hospitals could spend for new capital improvements, including computers.

  - Although there is no current federal or state legislation that will affect the handling of patient medical information, if it comes there would be an impact on computer systems.

- Almost all hospitals with over 100 beds have now automated, to varying degrees, their business office functions. About 30% have moved to automate medical functions, a potentially much larger market.

  - Physicans' offices and clinics are following this same pattern, though several years later.

- Medical treatment through outpatient clinics continues to increase about 10-15% per year. These clinics are becoming an integral part of most community hospitals.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Additional information about medical industry characteristics and use of EDP is contained in the following INPUT reports:

  - "Computer Services Markets in Hospitals," October 1978.

  - "Small Establishment Service - Medical Offices and Clinics," May 1979.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The medical industry sector will maintain a 17% AAGR. The major change will occur in the decline of batch delivery of processing services. Detailed forecasts are presented in Exhibit X-2.

  - The decline in batch services will be absorbed by both remote computing services and facilities management.

  - This trend is the result of many organizations within the medical sector, particularly hospitals and clinics, moving to on-line applications and developing integrated information systems for hospital-wide use.

  - Other batch services will be replaced by on-site minicomputer based hardware that is actively being marketed by RCS vendors as well as mainframe suppliers.

- Industry specialty will continue to be the dominant type of application purchased by users in this industry sector with hospital applications leading the way.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT X-2

COMPUTER SERVICES MARKET FORECAST - MEDICAL SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 9	$ 11	25%	$ 13	$ 17	$ 21	$ 26	$ 31	23%
	SCI. & ENG.	2	2	15	2	3	3	3	4	15
	IND. SPEC.	115	138	20	162	198	243	306	382	23
	UTILITY	6	7	20	8	10	12	14	17	19
SUBTOTAL		132	158	20	185	228	279	349	434	22
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	135	154	14	174	199	229	259	289	13
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		135	154	14	174	199	229	259	289	13
BATCH	GEN. BUS.	17	18	6	19	20	21	22	23	5
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	120	128	7	135	145	155	165	175	6
	UTILITY	6	7	9	7	7	7	7	7	0
SUBTOTAL		143	153	7	161	172	183	194	205	6
TOTAL PROCESSING	GEN. BUS.	26	29	12	32	37	42	48	54	13
	SCI. & ENG.	2	2	15	2	3	3	3	4	15
	IND. SPEC.	370	420	13	471	542	627	730	846	15
	UTILITY	12	14	17	15	17	19	21	24	11
TOTAL		410	465	13	520	599	691	802	928	15
SOFTWARE PRODUCTS	SYSTEM	17	24	40	34	47	66	92	129	40
	APPLICATION	22	27	23	36	47	62	82	108	32
TOTAL		39	51	31	70	94	128	174	237	36
PROFESSIONAL SERVICES		46	54	17	58	63	68	73	80	8
GRAND TOTAL		$ 495	$ 570	15%	$ 648	$ 756	$ 887	$1,049	$1,245	17%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

C. CHARACTERISTICS OF IN-HOUSE EDP ORGANIZATIONS

- There were not enough respondents to the user panel questionnaire in this industry sector to separately highlight the profile of the EDP manager. EDP manager respondents in this industry sector were grouped with respondents in the education industry, services industry, and other miscellaneous industries which are not separately tracked. The results are presented in Chapter XVII.

D. VENDOR ACTIVITIES

- McDonnell Douglas Automation (McAUTO) continued its expansion in the hospital market. It introduced its second hospital system combining McAUTO software with Tandem computers to provide a patient care system (PCS) for institutions with 700 beds or more.

  - PCS hardware/software package is a supplement to the earlier Hospital Data Collection System, which is a financially oriented system for hospitals in the 150-600 bed range.

- Shared Medical Systems further expanded its customer base in 1979. For the nine months ended September 30, 1979, revenues increased 32% to $59.6 million.

  - A number of its earlier service contracts are coming up for renewal and will be renegotiated.

- HBO and Company enhanced their product, MED PRO, in 1979 by adding a Resource Scheduling Module which does patient scheduling and appointments for clinics, outpatients, surgery, or radiology.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- HBO also released its advanced pharmacy applications during the fourth quarter 1979. It handles drug interactions, drug inventory, I.V. compatibility, I.V. tracking, etc.

- Technicon Medical Information Systems continued to expand its markets in 1979, reaching an estimated $20 million in revenue, all derived from the medical industry.

  - TMIS presently has 17 Technicon Medical Information Systems and 48 MATRIX FMS modules installed. Clients include El Camino Hosiptal in California ($1 million per year service contract); Jewish Hospital of St. Louis; Medical College of Virginia Hospitals; Methodist Hospital in Indiana; Nebraska Methodist; and St. Barnabas Medical Center in New Jersey.

- Northrup Data Systems, Inc. is a general manufacturing/systems company which offers financial services to clinics and hospitals.

  - It is currently upgrading its hardware to allow it to handle larger clinics and hospitals.

- CyCare Systems sells a user site hardware service to medical clinics.

  - Using Honeywell Level 6 minicomputers, patient registration, scheduling, accounts receivable, and insurance processing are performed. In addition, payroll, accounts payable, and general ledger applications are included as a part of the system.

- Medical Systems Corporation: The Spectra Medical Information System, Spectra 2000, includes hospital admission, transfer, and discharge (ATD), charting, physician order entry, and communications. Introduced in 1979:

  - Spectra Management and Administration, which handles the hospital financial area.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Medicus Nursing Management Systems, which handles nursing work load allocations and patient classifications.

- Computer Sciences Corporation has developed a hospital information system, HIS System 80, which will be ready for delivery in early 1980.

  - The system was developed at Memorial Hospital Medical Center of Long Beach, California.

  - System components include admission, transfer, and discharge (ATD), finance and administration, nursing and special services, pathology, pharmacy, radiology, and communciations.

- NCR Corporation offered a new system in 1979 for inventory, purchasing, and food service programs for hospitals using the 8000 series of interactive computers.

  - They also offer a software package to meet the billing and accounts receivable processing needs of anesthesiologists. The package is designed for use with the NCR 499 data processing system and can handle the requirements of 9-12 doctors and anesthesiologists.

- The Reynolds and Reynolds Company announced that it is establishing a joint marketing agreement with a unit of Baxter Traveral Laboratories, Inc., to sell computerized inventory management systems to hospitals.

- There is a proliferation of turnkey systems vendors to professional offices of physicians, dentists, and optometrists.

- The following is a listing of some of the less well known firms who are active in the medical industry.

  - AIS Corporation, Basking Ridge, NJ. Patient Financial Accounting Management System for physicians and clinics.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- AIS Data System, Inc., Austin, TX. Medical System for physicians and clinics; doing patient billing, word processing, insurance, patient histories, and daily reports.

- Allied Data, Olympia, WA. Medical claims system for insurance settlements.

- Applied Data Communications, Tustin, CA. Clinic 2 handles insurance and medical forms for medical clinics.

- Edelman Systems, Inc. Turnkey systems for physicians offices and clinics.

- Fisher-Stevens, Inc., Clifton, NJ. IBM based systems for the pharmaceutical industry.

- Information Access Systems, Inc., West Caldwell, NJ. Medical billing and information system for physicians offices.

- Keane Associates, Inc., Boston, MA. Facilities management services for hospitals, presently serving 30 hospitals. They introduced a new scheduling system for hospitals in 1979.

- Occidental Computer Systems, Inc., Van Nuys, CA. Patient billing and accounts receivable minicomputer based computer systems offered in 1979.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XI EDUCATION INDUSTRY SECTOR MARKETS

XI EDUCATION INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- The education sector employs approximately 4.5 million people, of which over 75% work in the elementary and secondary education sector. Data is presented in Exhibit XI-1.

- Growth in education is being limited by:
  - Declining enrollment in primary schools.
  - Reduced spending at the state and local levels due to taxpayer resistance.
  - Entrenched current faculty and administration who often resist change.

- Still, education remains an industry sector with a promising long-term future for electronic products and services as vehicles to provide lower cost solutions for education and training.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XI-1

EDUCATION INDUSTRY SECTOR-
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	EXPENDITURES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES	- 146,885 4,487,000
821	ELEMENTARY AND SECONDARY	EXPENDITURES (1977) NUMBER OF SCHOOLS (1976) NUMBER OF EMPLOYEES 1975)	$78.6 BILLION 106,200 3,435,000
822	HIGHER EDUCATION	EXPENDITURES (1977) NUMBER OF COLLEGES (1976) NUMBER OF EMPLOYEES (1976)	$40.3 BILLION 2,765 793,000
823	LIBRARIES AND SIMILAR	EXPENDITURES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1977)	- 29,345 208,000
824	CORRES-PONDENCE AND VOCATIONAL	EXPENDITURES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 1,324 16,000
829	SCHOOLS AND EDUCATIONAL SERVICES (N.E.C.)	EXPENDITURES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 7,251 35,000

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- Education is the smallest market for computer services approximating 10% of the largest segment (banking and finance) and 2% of the total computer services industry. Details are presented in Exhibit XI-2.

- The growth potential for services in education is the lowest of the 14 industry sectors tracked.

- The major opportunity for services is in the industry specialty area for applications, such as student scheduling, CAI (Computer Assisted Education), and CMI (Computer Managed Education).

- Some opportunity exists in general business applications as schools look for efficiencies in the face of tighter budgets.

- Software products will continue to grow from a modest base. Opportunities in systems software are brightest, as institutions attempt to maximize machine efficiency to postpone hardware additions.

C. EDP USAGE

- There were not enough respondents to the user panel questionnaire in this industry sector to separately highlight the profile of the EDP manager. EDP manager respondents in this industry sector were grouped with respondents in the medical industry, services industry, and other miscellaneous industries which are not separately tracked. The results are presented in Chapter XVII.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XI-2

COMPUTER SERVICES MARKET FORECAST -
EDUCATION SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 9	$ 11	22%	$ 13	$ 15	$ 18	$ 21	$ 25	18%
	SCI. & ENG.	7	7	7	8	8	9	10	11	9
	IND. SPEC.	6	8	25	10	12	15	18	21	21
	UTILITY	16	18	9	20	22	23	24	25	7
SUBTOTAL		38	44	15	51	57	65	73	82	13
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	17	20	18	23	27	32	37	43	17
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		17	20	18	23	27	32	37	43	17
BATCH	GEN. BUS.	8	9	10	9	10	11	12	13	8
	SCI. & ENG.	2	2	0	2	2	2	2	2	0
	IND. SPEC.	17	19	10	21	25	28	29	29	9
	UTILITY	8	9	11	9	9	9	9	9	0
SUBTOTAL		35	39	10	41	46	50	52	53	6
TOTAL PROCESSING	GEN. BUS.	17	20	15	22	25	29	33	38	14
	SCI. & ENG.	9	9	5	10	10	11	12	13	8
	IND. SPEC.	40	47	16	54	64	75	84	93	15
	UTILITY	24	27	11	29	31	32	33	34	5
TOTAL		$ 90	$ 103	13%	$ 115	$ 130	$ 147	$ 162	$ 178	12%
SOFTWARE PRODUCTS	SYSTEM	$ 28	$ 35	25%	$ 44	$ 55	$ 68	$ 85	$ 107	25%
	APPLICATION	9	11	18	13	15	18	21	24	17
TOTAL		$ 37	$ 46	24%	$ 57	$ 70	$ 86	$ 106	$ 131	23%
PROFESSIONAL SERVICES		36	43	19	49	56	64	73	84	14
GRAND TOTAL		$ 163	$ 192	18%	$ 221	$ 256	$ 297	$ 341	$ 393	15%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

D. VENDOR ACTIVITIES

- Control Data continues to be extremely active in this sector.

  - PLATO, the computer assisted instruction (CAI) offering, has more users than any other CAI product. There are over 750 courses available with the PLATO service. This is an order of magnitude more than any other vendor.

  - PLATO is targetted at business and industry, as well as colleges and schools.

- Computer Curriculum has been extremely successful in selling a turnkey system to elementary and secondary schools. Students using the system are reported to be able to learn faster and to retain the material learned longer.

- Information Associates, Inc. (IAI), has added Financial Aid Management to its line of administrative software for colleges and universities.

  - Developed jointly with Indiana University, this product covers applicant processing, student budgets, resource auditing, award and rejection letters, fund management, and other functions.

  - This dictionary-driven system gives the user the ability to store and change data, as well as giving non-programmers wide latitude in creating ad hoc reports to meet changing demands without reprogramming. Users have a choice of complete on-line operation or a full batch processing system.

- IAI has also developed a line of software called INTERACT, which is designed to serve small colleges and runs on Harris S125 or larger hardware. INTERACT covers human resource management, financial management, and student/alumni information.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The Discover Foundation has developed an extensive computer based software package called, "Discover, The Career Guidance System." The purpose of the system is to assist junior and senior high school students plan a career by cutting through a maze of available information.

  - The package operates on an IBM 370.

  - Six data bases are used, including a listing of colleges and universities, fields of study offered by schools, and geographic school location.

  - The package is marked by IBM as an "installed user program."

- Quodata Systems offers QDMS, a data management system that is particularly attractive to small colleges because of its low cost. It can be used as a data file by alumni offices, as well as for admission records and registration functions.

  - QDMS does not require a large amount of machine resource. It is designed to function on the smaller DEC PDP-11 hardware configurations under the NSTS/E operating system. The system is priced at $5,000.

- Columbia Computer Services is offering a school system software package for IBM 370 computers. The system handles student scheduling, grade reporting, attendance reporting, transcript preparation, as well as a series of management reports.

- Apple Computer and Tandy Corporation are among a group of about ten microcomputer manufacturers that have targeted the education industry as a high potential market.

  - Apple and Tandy have already established relationships with school districts that have installed their respective microcomputers.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The product offerings are student scheduling, accounting, and CMI. CAI will probably be added within the next 12 months.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XII RETAIL INDUSTRY SECTOR MARKETS

XII RETAIL INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- A most significant statistic relative to the retailing industry sector is the large number of establishments (1.2 million), as shown in the demographic data in Exhibit XII-1.

- Over 65% of industry revenues come from three subsectors: general merchandise, food stores, and automotive dealers/gasoline service stations.

- Compared to other industries, there are no really dominant companies.

  - The 50 largest retailing companies accounted for less than 20% of industry revenues in 1976.

  - Only in the general merchandise subsector is there a significant number of companies with over 1,000 employees, as shown in Exhibit XII-2.

- Average sales per employee varies widely by industry subsector, from $22,000 in eating and drinking establishments to $100,000 in building materials and hardware stores. Higher sales per employee tends to indicate a higher potential for services.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XII-1

RETAIL INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	SALES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1978)*	$677.3 BILLION 1.2 MILLION 14.5 MILLION
52	BUILDING MATERIALS, HARDWARE	SALES (1978) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$44.0 BILLION 61,681 441,837
53	GENERAL MERCHANDISE	SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$104.2 BILLION 41,219 1.9 MILLION
54	FOOD STORES	SALES (1978) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$174.5 BILLION 162,010 1.9 MILLION
55	AUTOMOTIVE DEALERS & GASOLINE SERVICE STATIONS	SALES (1978) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$163.7 BILLION 229,257 1.7 MILLION
56	APPAREL & ACCESSORIES	SALES (1978) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$37.8 BILLION 112,089 834,315
57	FURNITURE, HOME FURNISHINGS & EQUIPMENT	SALES (1978) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$37.0 BILLION 81,119 492,301
58	EATING & DRINKING	SALES (1978) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$70.1 BILLION 272,633 3.2 MILLION
59	MISCELLANEOUS RETAIL	SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$46.0 BILLION 246,595 1.6 MILLION

* INDIVIDUAL SUBSECTOR EMPLOYEE STATISTICS NOT AVAILABLE FOR 1978

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XII-2

RETAIL ORGANIZATIONS -
DISTRIBUTION BY SIZE, 1976

INDUSTRY SIC	INDUSTRY NAME	NUMBER OF ESTABLISHMENTS (SALES RANGES) BY NUMBER OF EMPLOYEES			
		1-99	100-249	250-999	1,000 & OVER
52	BUILDING MATERIALS, HARDWARE	61,579	95	7	-
53	GENERAL MERCHANDISE	36,272	3,319	1,535	93
54	FOOD STORES	160,801	1,154	55	-
55	AUTO DEALERS AND GASOLINE SERVICE STATIONS	228,534	705	17	1
56	APPAREL AND ACCESSORIES	111,714	309	66	-
57	FURNITURE, HOME FURNISHINGS AND EQUIPMENT	80,996	105	18	-
58	EATING AND DRINKING	270,954	1,502	175	2
59	MISCELLANEOUS RETAIL	246,119	394	61	21

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The trend to large discount stores which carry many lines of merchandise, including food, is blurring the distinctions between subsectors.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- Computer services markets in the retail industry sector are growing faster than the overall rate of the total U.S. computer services market, as shown in Exhibit XII-3. The size of the retail industry market, however, is still relatively small, equaling 6% of the total market.

- Retailers are looking to computers to help contain the spiraling costs in this industry. Since much of the data processing activity is in-house, retailers are looking for software products that can help solve problems.

- Smaller retailers are beginning to evaluate and purchase turnkey systems which are sold as being an aid to solving the escalating costs problem. This small group is also an excellent target for processing services companies because of the need of the retailer to control all financial aspects of the business - a solution easily provided by processing services vendors.

- With regard to modes of service, RCS dominates with 52% of processing services.

  - Batch still has an important position, securing over 25% of the market.

  - Batch will grow slowly through 1984, and virtually all of the growth will be in the general business type of service.

- FM has not been a factor in the retail industry. This will continue to be the case as in-house EDP remains dominant.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Additional information about medical industry characteristics and use of EDP is contained in the following INPUT reports:

  - "Computer Services Markets in Hospitals," October 1978.

  - "Small Establishment Service - Medical Offices and Clinics," May 1979.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The medical industry sector will maintain a 17% AAGR. The major change will occur in the decline of batch delivery of processing services. Detailed forecasts are presented in Exhibit X-2.

  - The decline in batch services will be absorbed by both remote computing services and facilities management.

  - This trend is the result of many organizations within the medical sector, particularly hospitals and clinics, moving to on-line applications and developing integrated information systems for hospital-wide use.

  - Other batch services will be replaced by on-site minicomputer based hardware that is actively being marketed by RCS vendors as well as mainframe suppliers.

- Industry specialty will continue to be the dominant type of application purchased by users in this industry sector with hospital applications leading the way.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT X-2

COMPUTER SERVICES MARKET FORECAST - MEDICAL SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 9	$ 11	25%	$ 13	$ 17	$ 21	$ 26	$ 31	23%
	SCI. & ENG.	2	2	15	2	3	3	3	4	15
	IND. SPEC.	115	138	20	162	198	243	306	382	23
	UTILITY	6	7	20	8	10	12	14	17	19
SUBTOTAL		132	158	20	185	228	279	349	434	22
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	135	154	14	174	199	229	259	289	13
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		135	154	14	174	199	229	259	289	13
BATCH	GEN. BUS.	17	18	6	19	20	21	22	23	5
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	120	128	7	135	145	155	165	175	6
	UTILITY	6	7	9	7	7	7	7	7	0
SUBTOTAL		143	153	7	161	172	183	194	205	6
TOTAL PROCESSING	GEN. BUS.	26	29	12	32	37	42	48	54	13
	SCI. & ENG.	2	2	15	2	3	3	3	4	15
	IND. SPEC.	370	420	13	471	542	627	730	846	15
	UTILITY	12	14	17	15	17	19	21	24	11
TOTAL		410	465	13	520	599	691	802	928	15
SOFTWARE PRODUCTS	SYSTEM	17	24	40	34	47	66	92	129	40
	APPLICATION	22	27	23	36	47	62	82	108	32
TOTAL		39	51	31	70	94	128	174	237	36
PROFESSIONAL SERVICES		46	54	17	58	63	68	73	80	8
GRAND TOTAL		$ 495	$ 570	15%	$ 648	$ 756	$ 887	$1,049	$1,245	17%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

C. CHARACTERISTICS OF IN-HOUSE EDP ORGANIZATIONS

- There were not enough respondents to the user panel questionnaire in this industry sector to separately highlight the profile of the EDP manager. EDP manager respondents in this industry sector were grouped with respondents in the education industry, services industry, and other miscellaneous industries which are not separately tracked. The results are presented in Chapter XVII.

D. VENDOR ACTIVITIES

- McDonnell Douglas Automation (McAUTO) continued its expansion in the hospital market. It introduced its second hospital system combining McAUTO software with Tandem computers to provide a patient care system (PCS) for institutions with 700 beds or more.

  - PCS hardware/software package is a supplement to the earlier Hospital Data Collection System, which is a financially oriented system for hospitals in the 150-600 bed range.

- Shared Medical Systems further expanded its customer base in 1979. For the nine months ended September 30, 1979, revenues increased 32% to $59.6 million.

  - A number of its earlier service contracts are coming up for renewal and will be renegotiated.

- HBO and Company enhanced their product, MED PRO, in 1979 by adding a Resource Scheduling Module which does patient scheduling and appointments for clinics, outpatients, surgery, or radiology.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- HBO also released its advanced pharmacy applications during the fourth quarter 1979. It handles drug interactions, drug inventory, I.V. compatibility, I.V. tracking, etc.

- Technicon Medical Information Systems continued to expand its markets in 1979, reaching an estimated $20 million in revenue, all derived from the medical industry.

  - TMIS presently has 17 Technicon Medical Information Systems and 48 MATRIX FMS modules installed. Clients include El Camino Hosiptal in California ($1 million per year service contract); Jewish Hospital of St. Louis; Medical College of Virginia Hospitals; Methodist Hospital in Indiana; Nebraska Methodist; and St. Barnabas Medical Center in New Jersey.

- Northrup Data Systems, Inc. is a general manufacturing/systems company which offers financial services to clinics and hospitals.

  - It is currently upgrading its hardware to allow it to handle larger clinics and hospitals.

- CyCare Systems sells a user site hardware service to medical clinics.

  - Using Honeywell Level 6 minicomputers, patient registration, scheduling, accounts receivable, and insurance processing are performed. In addition, payroll, accounts payable, and general ledger applications are included as a part of the system.

- Medical Systems Corporation: The Spectra Medical Information System, Spectra 2000, includes hospital admission, transfer, and discharge (ATD), charting, physician order entry, and communications. Introduced in 1979:

  - Spectra Management and Administration, which handles the hospital financial area.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Medicus Nursing Management Systems, which handles nursing work load allocations and patient classifications.

- Computer Sciences Corporation has developed a hospital information system, HIS System 80, which will be ready for delivery in early 1980.

  - The system was developed at Memorial Hospital Medical Center of Long Beach, California.

  - System components include admission, transfer, and discharge (ATD), finance and administration, nursing and special services, pathology, pharmacy, radiology, and communciations.

- NCR Corporation offered a new system in 1979 for inventory, purchasing, and food service programs for hospitals using the 8000 series of interactive computers.

  - They also offer a software package to meet the billing and accounts receivable processing needs of anesthesiologists. The package is designed for use with the NCR 499 data processing system and can handle the requirements of 9-12 doctors and anesthesiologists.

- The Reynolds and Reynolds Company announced that it is establishing a joint marketing agreement with a unit of Baxter Traveral Laboratories, Inc., to sell computerized inventory management systems to hospitals.

- There is a proliferation of turnkey systems vendors to professional offices of physicians, dentists, and optometrists.

- The following is a listing of some of the less well known firms who are active in the medical industry.

  - AIS Corporation, Basking Ridge, NJ. Patient Financial Accounting Management System for physicians and clinics.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- AIS Data System, Inc., Austin, TX. Medical System for physicians and clinics; doing patient billing, word processing, insurance, patient histories, and daily reports.

- Allied Data, Olympia, WA. Medical claims system for insurance settlements.

- Applied Data Communications, Tustin, CA. Clinic 2 handles insurance and medical forms for medical clinics.

- Edelman Systems, Inc. Turnkey systems for physicians offices and clinics.

- Fisher-Stevens, Inc., Clifton, NJ. IBM based systems for the pharmaceutical industry.

- Information Access Systems, Inc., West Caldwell, NJ. Medical billing and information system for physicians offices.

- Keane Associates, Inc., Boston, MA. Facilities management services for hospitals, presently serving 30 hospitals. They introduced a new scheduling system for hospitals in 1979.

- Occidental Computer Systems, Inc., Van Nuys, CA. Patient billing and accounts receivable minicomputer based computer systems offered in 1979.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XI EDUCATION INDUSTRY SECTOR MARKETS

EXHIBIT XII-3

COMPUTER SERVICES MARKET FORECAST -
RETAIL SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 20	$ 27	33%	$ 33	$ 40	$ 47	$ 55	$ 63	25%
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	225	272	21	329	398	482	583	705	21
	UTILITY	25	30	19	36	42	51	60	72	19
SUBTOTAL		270	329	22	398	480	580	698	840	21
FACILITIES MANAGEMENT	GEN. BUS.	–	–	–	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	5	6	18	8	9	10	12	14	18
	UTILITY	–	–	–	–	–	–	–	–	–
SUBTOTAL		5	6	18	8	9	10	12	14	18
BATCH	GEN. BUS.	65	68	5	80	93	107	122	138	15
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	70	77	10	77	78	78	78	79	1
	UTILITY	25	26	4	26	26	26	26	26	0
SUBTOTAL		160	171	7	183	197	211	226	243	7
TOTAL PROCESSING	GEN. BUS.	85	95	12	113	133	154	177	201	16
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	300	355	18	414	485	570	673	798	18
	UTILITY	50	56	12	62	68	77	86	98	12
TOTAL		435	506	16	589	686	801	936	1,097	17
SOFTWARE PRODUCTS	SYSTEM	24	35	46	53	79	118	177	265	50
	APPLICATION	26	34	31	46	61	82	110	147	34
TOTAL		50	69	38	99	140	200	287	412	43
PROFESSIONAL SERVICES		50	59	18	70	84	99	118	140	19
GRAND TOTAL		$ 535	$ 634	19%	$ 758	$ 910	$1,100	$1,341	$1,649	21%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Industry specialty is the dominant type of processing service, with 70% of 1979 revenues.

  - Applications such as credit authorization have continued potential.

  - Special applications for subsectors, such as automobile dealers, have been growth opportunities; with cheaper hardware, other subsectors, such as fast food, will become approachable.

  - Point-of-sale, however, remains almost totally an in-house application.

  - General business applications via RCS have potential from a current small base, with banks having an inside track because of the relationship of POS and EFTS.

- Software products show a good growth percentage, but from a small base:

  - Software products are only 11% of services revenues in the retail industry sector, but will grow to 25% by 1984.

  - The systems software growth rate is extremely high, at 50%.

- The increasing need for communications based applications is a key driving force for the growth in professional services, since the capability to install such applications cannot be met totally with in-house talent.

- Energy shortages and restrictions on travel will cause an increase in shipping from the home in the 1980s. Services in support of catalog sales, telemarketing, etc., will prosper.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

C. EDP USAGE

- INPUT's 1979 user panel includes 20 EDP managers in the retail sector. Their responses to a detailed questionnaire are the basis for this section.

- EDP managers purchased 64% more outside services in 1978 than the overall industry average.

  - Remote batch processing, facilities management, and hardware maintenance are the major categories where retail companies spend more than do most other industries.

  - The purchase of outside services between 1978 and 1979 is estimated by EDP managers to increase 70%, as shown in Exhibit XII-4.

D. VENDOR ACTIVITIES

- Most of the vendor activity in the retailing industry is directed toward specific subsector markets, such as:

  - Credit checking and reporting.

  - Automotive dealer services.

  - Point-of-sale services.

  - Pharmacy processing.

- Turnkey systems vendors have found the pharmacy subsector to be attractive. Although there are no dominant vendors yet, Honeywell and others have announced turnkey system products to serve this market segment.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XII-4

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE RETAIL SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$0-70	$ 9	$0-40	$ 7	(27%)	(20%)
REMOTE BATCH	0-250	21	0-400	33	60	4
BATCH	0-100	8	-	-	(100)	-
INPUT/OUTPUT	0-60	13	0-35	9	(31)	9
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-65	12	0-142	23	90	12
APPLICATIONS SOFTWARE	0-85	7	0-114	15	104	28
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-100	11	0-1000	181	1,559	15
EDP CONSULTING	0-100	.2	0-300	25	N/A	-
EDUCATION	0-15	4	0-18	5	31	5
OTHER	-	-	0-3	.2	N/A	-
FACILITIES MANAGEMENT	0-1900	158	0-1900	158	-	-
MAINTENANCE						
HARDWARE	0-400	67	0-400	72	7	1
SOFTWARE	0-5	.5	0-10	1	165	30
TOTAL OUTSIDE SERVICES EXPENDITURES	$ 0-1900	$ 312	$0-1900	$ 533	70%	10%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Restaurants, particularly fast food chains, are beginning to utilize the computer effectively to help manage their businesses.

  - Carl's Jr., a 250 store chain, uses a system supplied by HLX Systems of Anaheim to control orders from time of entry by the cashier, to the cooks for preparation, and finally to the customer. Inventory control, accounting and labor reporting functions are also provided by the system.

  - Cassano's, a 115 store chain, and Ponderosa, a 600 store chain, use NCR point-of-sale systems to control orders, sales analysis, payroll, inventory, and accounting.

  - Dunkin Donut, the largest donut shop chain in the world, uses a GTE system that has functions similar to the NCR POS system.

- NCR also offers an accounting service for small retailers. The service allows the retailers to tie into one of 24 NCR data centers in the U.S.

- Supermarkets are also installing point-of-sale equipment.

  - NCR and IBM offer scanning systems.

  - Data Terminal Systems sells a POS device coupled with a scale for weighing items in bulk. The scale system automatically records the amount on the cash register transaction tape eliminating the need for the cashier to do any calculations or special key entries.

- Microcomputer turnkey sytems are also available from vendors such as Educational Data Systems.

  - This vendor offers a turnkey system for clubs and restaurants, although similar systems are sold to hotels and motels.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The turnkey system includes POS processing, membership billing, and accounting.

- The entire system, which includes a POINT 4 computer, is priced at $4,000.

- Cable television systems are gearing up for POS activity. Two-way CATV networks in Ohio and other areas allow the customer to view merchandise on the television screen and to subsequently order it through a small keyboard.

- Reynolds and Reynolds offers a wide range of services to retail businesses.

  - Computers are sold to automobile, truck, motorcycle, and farm implement dealers for in-house use.

  - Interactive and batch processing services are sold to all types of retail establishments.

  - Applications available include payroll, accounting, and inventory management.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XIII WHOLESALE INDUSTRY SECTOR MARKETS

XIII WHOLESALE INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- An important characteristic of the wholesale industry sector is the preponderance of small establishments. The average firm has 12 employees and only 1% of all wholesalers have more than 250 employees.

- Nearly 60% of the establishments are involved in durable goods wholesaling as Exhibit XIII-1 shows. The balance of the activity in this industry is in non-durable goods wholesaling.

- The wholesale industry is one of the largest industries in revenue production. This reflects the value of goods that pass from producers through wholesalers to the ultimate end user.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- A unique chracteristic of the wholesale industry segment is the large size of batch processing services revenues relative to RCS as tabulated in Exhibit XIII-2.

  - This is a result of the historic relationship between the local batch service bureau and the local wholesaler.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XIII-1

WHOLESALE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	TOTAL SALES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	 350,545 4.2 MILLION
501	MOTOR VEHICLES AND AUTOMOTIVE	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$38.8 BILLION 36,041 408,010
502	FURNITURE	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$7.7 BILLION 9,228 95,445
503	LUMBER AND CONSTRUCTION	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$20.1 BILLION 15,098 171,893
504	SPORTING GOODS AND TOYS	TOTAL SALES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 5,626 75,201
505	METALS AND MINERALS	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$26.8 BILLION 8,332 128,632
506	ELECTRICAL GOODS	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$28.9 BILLION 22,550 260,324
507	HARDWARE, PLUMBING AND HEATING	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES 1976)	$19.3 BILLION 16,875 185,386
508	MACHINERY AND EQUIPMENT	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$56.4 BILLION 76,311 938,763

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XIII-1 (CONT.)

WHOLESALE INDUSTRY SECTOR-
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
509	MISCELLANEOUS DURABLES	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$3.3 BILLION 15,924 162,202
511	PAPER AND PAPER PRODUCTS	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$13.1 BILLION 10,528 138,624
512	DRUGS AND SUNDRIES	TOTAL SALES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 3,472 85,288
513	APPAREL, PIECE GOODS AND NOTIONS	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$17.3 BILLION 11,585 128,593
514	GROCERIES AND RELATED PRODUCTS	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$93.9 BILLION 34,893 579,817
515	FARM PRODUCTS	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$45.2 BILLION 13,243 127,690
516	CHEMICALS AND ALLIED PRODUCTS	TOTAL SALES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 6,760 85,030
517	PETROLEUM AND PETROLEUM PRODUCTS	TOTAL SALES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 20,468 186,907

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XIII-1 (CONT.)

WHOLESALE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
518	BEER, WINE AND DISTILLED BEVERAGES	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$21.6 BILLION 6,380 117,820
519	MISCELLANEOUS NON-DURABLES	TOTAL SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$55.1 BILLION 37,231 355,271

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XIII-2

COMPUTER SERVICES MARKET FORECAST - WHOLESALE SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 51	$ 62	21%	$ 73	$ 87	$ 110	$ 129	$ 154	20%
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	74	90	22	108	128	152	187	224	20
	UTILITY	19	22	18	26	31	36	41	47	16
SUBTOTAL		144	174	21	207	246	298	357	425	20
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	29	33	14	37	42	48	54	61	13
	UTILITY	4	5	12	5	6	7	8	8	10
SUBTOTAL		33	38	14	42	48	55	62	69	13
BATCH	GEN. BUS.	107	113	6	130	149	172	198	229	15
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	32	34	6	34	35	35	36	36	1
	UTILITY	78	85	9	89	92	93	94	95	2
SUBTOTAL		217	232	7	253	276	300	328	360	9
TOTAL PROCES-SING	GEN. BUS.	158	175	11	203	236	282	327	383	17
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	135	157	16	179	205	235	277	321	15
	UTILITY	101	112	11	120	129	136	143	150	6
TOTAL		$ 394	$ 444	$ 13%	$ 502	$ 570	$ 653	$ 747	$ 854	14%
SOFTWARE PRODUCTS	SYSTEM	$ 16	$ 24	$ 50%	$ 37	$ 58	$ 91	$ 142	$ 220	56%
	APPLI-CATION	45	58	29	77	103	136	181	241	33
TOTAL		$ 61	$ 82	34%	$ 114	$ 161	$ 227	$ 323	$ 461	41%
PROFESSIONAL SERVICES		42	49	17	58	68	81	95	114	18
GRAND TOTAL		$ 497	$ 575	16%	$ 674	$ 799	$ 961	$1,165	$ 1,429	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The stable product line of most wholesalers and the emphasis on standard general business applications have allowed this business to endure.

- Much of the batch work is customized because of the different characteristics of different types of wholesalers.

- However, the need for obtaining information more rapidly on inventory control, credit, shipping, etc., will change the nature of the processing in this industry. RCS revenues will exceed batch revenues after 1982.

- Remote computing services is the fastest growing processing mode.

  - The growth in both general business and industry specialty processing reflects the need of wholesalers to obtain information more rapidly than batch systems can provide.

  - Turnkey systems are competing successfully with RCS, which is reflected in the RCS growth rate for the next five years.

- Software products revenue will grow the fastest of all modes of computer services in the next five years.

  - Systems software will grow at 56% a year, but is growing from a very small base.

  - Applications software is growing at 33% a year. Wholesalers are looking for software products that provide the capability to access data in a timely fashion: interactive or inquiry products. Standard accounting packages are also required by wholesalers that are buying computers for in-house use.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Professional services are growing slower than the overall industry average. Wholesalers, in many cases, cannot afford the expense of custom programming.

- Turnkey systems are being installed by many small wholesalers. The lack of need for distributed processing and the stability in the nature of the computer requirements make this industry an excellent target for the turnkey vendor. The nature of the EDP needs of the small wholesaler is different from the larger wholesaler as will be pointed out later. The larger wholesaler is not as good a target for turnkey systems because DDP is needed in the larger companies.

C. EDP USAGE

- INPUT's 1979 user panel includes 20 EDP managers in the wholesale sector. Their responses to a detailed questionnaire are the basis for this section.

- The wholesale EDP manager's response cannot be considered to be representative of the entire industry, but only of the largest companies in the industry. The respondents represent companies in the top 1% of the industry only.

- Average expenditures for outside services by EDP managers are shown in Exhibit XIII-3.

  - EDP managers purchased nearly 70% less outside services in 1978 than the overall industry average.

  - The purchase of outside services between 1978 and 1979 is estimated by EDP managers to increase over 200%. This would substantially close the gap in use of outside services between the wholesale industry and the rest of the industries.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XIII-3

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE WHOLESALE SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$ 0-11	$ 1	$ 0-300	$ 5	445%	(6%)
REMOTE BATCH	0	-	0	-	-	-
BATCH	0-10	-	0	-	-	-
INPUT/OUTPUT	0-24	6	0-50	10	55	11
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-18	4	0-50	11	206	16
APPLICATIONS SOFTWARE	0-70	14	0-60	10	(33)	9
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-5	1	0-200	6	500	-
EDP CONSULTING	0-2	-	0-5	1	249	1
EDUCATION	0-30	8	0-30	9	14	9
OTHER	0	-	0	-	-	(6)
FACILITIES MANAGEMENT	0	-	0	-	-	-
MAINTENANCE						
HARDWARE	0-120	27	0-130	36	32	3
SOFTWARE	0-2	-	0-19	2	792	2
TOTAL OUTSIDE SERVICES EXPENDITURES	$0-221	$ 63	$ 0-529	$ 210	234%	1%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

D. VENDOR ACTIVITIES

- Much of the vendor activity is industry specialized. Vendors have carved out specific segments of the market to be served.

  - Automatic Data Processing's Autonet and Dealer services provides processing services to wine/spirit distributors, as well as automotive equipment dealers.

  - Informatics, through it Management Horizons Data Systems Group, supplies drug, food, and building materials firms specialized processing services. The services include sales analysis, mechandising management, inventory control, and product price management.

  - NCR offers a variety of industry specific software to serve groups, such as plumbing and heating firms, fuel and petroleum dealers, food distributors, beer distributors, and electrical distributors.

- Turnkey systems have proliferated in this industry. Many have been announced in the past year.

  - Distribution Management Systems has a DEC PDP-11 and IBM Series/1 warehousing system.

  - Genuine Parts Company sells a system for order entry and inventory control.

  - Manus Services sell a DEC based system.

  - Praxa Data Centers offers a DEC based interactive system.

- Sun Information Service Company has introduced the third generation of their automated bulk terminal (ABT) system.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The system is designed to control truck loading operations and to generate the necessary management reports. It covers such operations as badge validation and lockout, gate access, enable/disable of valves and pumps, plus many other modules.

- A turnkey, ABT system cost ranges from $20,000 to $80,000, depending upon the size of the terminal and the range of features selected.

- Integrated Data Corporation now offers The Autologue Computer System, geared specifically to the needs of the automotive jobber and warehouse distributor.

  - Major applications features include counterman point-of-sale activity, inventory control and stock replenishment, customer accounts receivable, and sales reporting.

  - The basic system includes a TI Model 810 output printer, a TI 911 VDT, a full auto keyboard, and a TI 990/5 processor. The system has a capacity for up to 20,000 parts numbers and can be expanded for up to 100,000 parts numbers.

- Anthem Systems Company offers a turnkey system for wholesale and industrial sales offices called Autoquote.

  - The system automatically generates sales quotations, updates price lists, and forecasts sales.

  - It operates on a 32K IMSAI PDP-44 minicomputer with the CP/M operating system.

  - The configuration leases for $350 per month or for $450 per month using a DEC LA180 printer and RS-232C communications interfaces.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Distronics Corporation, a Western Union subsidiary, offers an on-site microprocessor for wholesale distributors.

  - The system makes use of CRT formatted invoicing functions as well as on-site processing capability and general information handling.

  - It links wholesalers directly from their offices to the central Distronics computer facility in St. Louis, Missouri. The presence of on-site processing capability will now allow clients to verify business information on their own premises before updating the data in the central computer files.

  - The microprocessor is designated the Distronics D-1000 microcomputer and was developed specifically for Distronics by Western Union Information Systems.

- Many software products have been announced in 1979 to serve the wholesale industry. Representative announcements are discussed below.

- The Automated Quill, Inc., has introduced a Public Warehouse Accounting System, which is a computerized business accounting system designed for public warehouse companies. Designed to operate on Data Generals' NOVA and ECLIPSE processors, the warehouse package covers such standard accounting procedures as general ledger, income statement, and balance sheet. The general ledger subsystem may be used with, or independent of, other MINI-MIZ software modules from this company.

- J. Baker and Associates, Inc., now offers a generalized Route Distribution System for beer and/or soft drink distributors.

  - The system provides for three different types of Route Accounting Systems: driver sell, pre-sell, and a combination of driver sell and pre-sell.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The system operates in most DEC environments.

- Custom Computing Systems, Inc. offers an interactive Tiny Business Inventory Management System package.

  - The package is configured for the Apple II computer and requires a minimum of 48K bytes of memory plus peripherals.

  - Custom Computing also offers accounts payable and accounts receivable systems.

  - The Inventory Management System presently costs $100. All packages have a password system for security.

- Datamor, a subsidiary of Korvettes, Inc., now offers a purchase order management and warehouse distribution system known as Kommand.

  - Kommand operates on the IBM/System 370 Model 168, linked via phone lines to IBM 3277 CRTs installed in warehouses.

  - The system is also linked to Four-Phase systems minicomputers, which print shipping labels and price tickets.

- Distribution Management Systems, Inc., has developed a distributor network at Thomas J. Lipton, Inc., of four minicomputer based turnkey systems known as the DMS-1000.

  - The system is used primarily for on-line order entry and inventory update. It is intended to speed shipments and improve customer credit checking.

  - The four minicomputers, each at separate regional centers, are linked to an IBM 370/158 at the Lipton central computer facility and to various plants and public and private warehouses around the country.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The DMS-1000 system includes the DEC PDP-8 minis and CRTs and DMS software.

- Lipton is reported to have spent $500,000 on the system, but they claim that writing the system in-house would have cost between $2-3 million.

- Doyle Data Systems offers DISTRIBUTOR I, a large-scale, interactive, on-line distribution system for wholesalers.

  - The system utilizes Data Generals' ECLIPSE hardware and can support up to 20 on-line terminals and up to 20,000 transactions per day.

  - It covers open entry, invoicing, back order control, accounts receivable, accounts payable, inventory control, and purchasing.

- NCR Corporation presently offers its SPIRIT (Sales Processing Interactive Realtime Inventory Technique) system for wholesale distributors.

  - This system is an updated version of SPIRIT that was first introduced in 1974 for use with the NCR 8200.

  - This enhanced version includes new capabilities, such as remote printing of picking and packing slips, invoices, and customer and inventory status reports.

  - It can accommodate wholesalers with up to 16 warehouse locations.

- NCR Corproation has released the I-8150, Interactive Distribution System for electrical distributors and wholesalers.

  - The system is targeted at wholesale firms with under 20 employees and less than $2.5 million in annual sales.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The one-time license fee for the system is $3,495 or, under a rental plan, $105 per month.

- Bughaus, Inc., a network of Volkswagen service centers, has automated its management and accounting paperwork with a real-time minicomputer system.

  - Inventories now range from $12,000 to $14,000 at each of the company's eight repair locations, compared to $16,000 to $19,000 per center under the previous batch processing system.

  - Using a library of nearly 100 COBOL programs, the system independently controls inventories at each site and at the same time runs a master stock list for all locations.

  - The system runs on a Wang 128K byte CPU with printer and terminal peripherals.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XIV FEDERAL GOVERNMENT SECTOR MARKETS

XIV FEDERAL GOVERNMENT SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- The federal government's fiscal 1980 budget for commercial EDP is $5.3 billion, excluding classified systems.

  - This represents about 1% of total government expenditures.

  - The Department of Defense accounts for over 50% of EDP expenditures.

- The federal government has spent nearly $20 billion on all EDP.

- The federal government has over 11,000 computers installed.

  - Fifty-five percent of the installed base are minicomputers. The growth rate in minicomputer acquisition for the last six years has averaged 27% a year.

  - Less than 15% of the installed computer base are large mainframes which cost $500,000 or more when acquired. The growth rate in large mainframes for the last six years has averaged less than 4% a year.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The total installed base of computers has grown an average of 11% annually over the last eight years.

- The federal government classification of contract services is budgeted to grow 23% in fiscal year 1979 over fiscal year 1978. This government classification includes the following services purchased by government data centers:

  - Remote computing services.

  - Batch processing.

  - Professional services.

  - Data entry.

  - Hardware maintenance.

- Not all federal government computer services are included in this budgeted category.

  - Computer services purchased directly by end users and expenditures for classified systems are not included in the reported figures.

  - Software product expenditures for purchase, lease, rental or software maintenance are not included.

- The General Sservices Administration has changed its computer acquisition approval process. All systems costing $300,000 or less need not obtain GSA approval prior to purchase. The result of this policy change has been a dramatic increase in the purchase of small systems. Digital Equipment Corporation, Data General, and Hewlett-Packard have installed nearly 2,300 computers in the federal government sector in the last three years. This represents over 60% of all federal computer systems installed during that three year period.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- Federal government expenditures will increase at a 20% AAGR, slightly faster than the overall industry average. Refer to Exhibit XIV-1.

- Over 90% of the processing services revenues are derived from remote computing servicesand facilities management.

  - Remote computing services are expected to grow nearly twice as fast as facilities management for the next five years.

  - Currently, remote computing services and facilities management annual expenditures are each nearly $300 million dollars. This represents nearly one-half of the total expenditures for computer services by the federal government.

- Professional services expenditures in the federal government will exceed $1 billion by 1983. This represents over 25% of the entire market for professional services in the U.S.

- The market for systems software in the federal government will grow at 25% annually through 1984, but this is less than the 33% overall industry average.

- The applications software market is one of the slowest growing areas in the federal government, growing at 15% a year. Many of the government required applications are singular and are therefore developed internally, as well as through the use of professional services.

- There is legislation proposed that would force government agencies to purchase more computer services from outside of the federal government.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XIV-1

COMPUTER SERVICES MARKET FORECAST -
FEDERAL GOVERNMENT SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 21	$ 24	15%	$ 29	$ 36	$ 43	$ 53	$ 63	21%
	SCI. & ENG.	50	58	15	66	74	83	92	101	12
	IND. SPEC.	17	21	23	26	32	39	48	59	23
	UTILITY	164	197	20	248	318	400	500	615	26
SUBTOTAL		252	300	19	369	460	565	693	838	23
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	92	98	7	104	116	124	131	140	7
	IND. SPEC.	-	-	-	-	-	-	-	-	-
	UTILITY	153	182	19	207	242	282	332	387	16
SUBTOTAL		245	280	14	311	358	406	463	527	13
BATCH	GEN. BUS.	0	0	0	3	3	4	4	5	14
	SCI. & ENG.	8	9	13	9	9	10	10	10	2
	IND. SPEC.	-	-	-	-	-	-	-	-	-
	UTILITY	45	48	7	48	48	48	48	48	0
SUBTOTAL		53	57	8	60	60	62	62	63	2
TOTAL PROCESSING	GEN. BUS.	21	24	15	32	39	47	57	68	23
	SCI. & ENG.	150	165	10	179	199	217	233	251	9
	IND. SPEC.	17	21	23	26	32	39	48	59	23
	UTILITY	362	427	18	503	608	730	880	1,050	20
TOTAL		$ 550	$ 637	16%	$ 740	$ 878	$1,033	$1,218	$1,428	18%
SOFTWARE PRODUCTS	SYSTEM	$ 163	$ 204	25%	$ 255	$ 319	$ 398	$ 498	$ 623	25%
	APPLICATION	15	19	24	22	25	29	33	38	15
TOTAL		$ 178	$ 223	25%	$ 277	$ 344	$ 427	$ 531	$ 661	24%
PROFESSIONAL SERVICES		350	419	20	503	603	724	869	1,043	20
GRAND TOTAL		$1,078	$1,279	19%	$1,520	$1,825	$2,184	$2,618	$3,132	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Currently, the equivalent of some $7 billion in processing is performed internally. This is in addition to the $5.3 billion of commercial or outside expenditures budgeted for fiscal 1980.

- If this legislation passes it will obviously have a tremendous impact on not only the federal government sector, but on the entire computer services industry. The INPUT forecast does not include any of this potential revenue.

C. CHARACTERISTICS OF IN-HOUSE EDP ORGANIZATIONS

- INPUT did not send questionnaires for the user panel to federal government installations.

- Installation configuration data on all non-classified computer sites are available directly from the federal government.

D. VENDOR ACTIVITIES

- Computer Sciences Corporation, Planning Research Corporation, and System Development Corporation continue their roles as major suppliers of computer services to the federal government.

  - Computer Sciences Corporation's fiscal year 1979 revenues, derived from federal government contracts, amounted to $244 million or 71% of total revenues.

    . Twenty million dollars in revenues were derived from contract services, mainly with NASA, Department of Energy, Department of Agriculture, Federal Aviation Administration, and the General

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

Services Administration. The growth rate of contract services to the federal government was 30% between fiscal years 1978 and 1979.

. INFONET data services to the federal government amounted to $43 million in fiscal year 1979. This was about a 5% increase above 1978.

- Planning Research Corporation's 1979 fiscal year revenues from federal government contracts totalled $150.5 million, or 57% of total revenues.

. PRC has a major contract with NASA, where 1,100 people perform work at the Kennedy Space Center.

. Other major PRC contracts are with Goddard Space Flight Center, Office of Management and Budget, and the Joint Chiefs of Staff.

. PRC revenue from the federal government grew 15% in fiscal 1979 over fiscal 1978.

- System Development Corporation generated over 70% of its fiscal 1979 revenue from the federal government - over $120 million.

. This component of SDC's revenue grew 21% between 1978 and 1979 and accounted for all of the growth in revenue for the company.

. SDC has major contracts with the National Oceanic and Atmospheric Administration, Department of Energy, Office of Education, Environmental Protection Agency, NASA, U.S. Navy, and the Joint Chiefs of Staff.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Honeywell, Inc. and Intermetrics are developing a new high-level common computer language for new weapons systems. The language is presently intended to replace several languages now used by DOD.

- McDonnell Douglas Automation (McAUTO) has completed a computerized system called IVESS (Interactive Vehicle Scheduling System). IVESS is an interactive route scheduling system designed for the U.S. Post Office.

  - IVESS draws upon a data file of information to graphically display a route schedule for trucks. It also performs a cost analysis of each route.

- Western Union Telegraph Co. signed an agreement with the U.S. Postal Service that will provide high volume mail users with two day delivery of computerized messages via electronic transmission.

  - The Electronic Computer-Originated Mail (ECOM) service was designed for organizations that send thousands of messages on a continuing basis.

  - ECOM customers are required to meet a minimum volume of 5,000 messages per month. Rates range from 30 cents to 55 cents per page, depending on volume.

  - On December 5th, the USPS announced that Western Union had backed out of this contract. The USPS still wants to implement the system and other vendors are now eligible to bid on the project.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XV STATE AND LOCAL GOVERNMENT SECTOR MARKETS

XV STATE AND LOCAL GOVERNMENT SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- State and local government expenditures in 1977 were $265.3 billion, as shown in Exhibit XV-1. This was a decrease in expenditures, from $304.1 billion, in the previous year.

- Employment levels continue to be nearly five times the size of the federal government, with state and local government employing 12.7 million people.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- State and local government expenditures will increase at a 18% AAGR, as shown in Exhibit XV-2.

- Although RCS has a small base in processing services to state and local government of $54 million in 1979, it is expected to increase at an AAGR of 32% as a result of pressures to hold down spending at the state level which will retard expenditures for in-house systems, while demanding that more efficient procedures be implemented.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XV-1

STATE AND LOCAL GOVERNMENT -
DEMOGRAPHIC DATA

TYPE OF STATISTIC	DATA
REVENUES (1976/1977)	$294.5 BILLION
EXPENDITURES (1976/1977)	$265.3 BILLION
NUMBER OF EMPLOYEES (1978)	12.7 MILLION
NUMBER OF STATES (1977)	50
NUMBER OF MUNICIPALITIES (1972)	18,517
NUMBER OF TOWNSHIPS (1972)	16,991

EXPENDITURES BY FUNCTION FISCAL 1975/1976	EXPENDITURES ($ BILLION)	PERCENT
DIRECT GENERAL EXPENDITURES	$255.6	83.7%
EDUCATION	97.2	31.8
HIGHER EDUCATION	24.3	8.0
LOCAL SCHOOLS	67.7	22.2
HIGHWAYS	23.9	7.8
PUBLIC WELFARE	32.6	10.7
HEALTH	4.7	1.6
HOSPITALS	15.7	5.2
POLICE PROTECTION	9.5	3.1
LOCAL FIRE PROTECTION	3.9	1.3
NATURAL RESOURCES	4.7	1.5
SANITATION & SEWAGE	8.2	2.7
HOUSING & URBAN RENEWAL	3.2	1.0
LOCAL PARKS & RECREATION	3.9	1.3
FINANCIAL ADMINISTRATION	5.7	1.9
GENERAL CONTROL	10.3	3.4
UTILITY & LIQUOR STORE EXPEND.	19.5	6.4
WATER SUPPLY SYSTEM	5.9	1.9
ELECTRIC POWER SYSTEM	6.4	2.1
TRANSIT SYSTEM	4.4	1.5
GAS SUPPLY SYSTEM	0.7	0.2
LIQUOR STORES	2.1	0.7
INSURANCE TRUST EXPENDITURES	29.0	9.5
EMPLOYEE RETIREMENT	8.4	2.8
UNEMPLOYMENT COMPENSATION	18.9	6.2

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XV-2

COMPUTER SERVICES MARKET FORECAST -
STATE AND LOCAL GOVERNMENT SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 10	$ 12	20%	$ 17	$ 21	$ 29	$ 39	49	32%
	SCI. & ENG.	5	5	9	8	12	17	22	27	40
	IND. SPEC.	7	8	15	12	18	23	30	36	35
	UTILITY	24	29	21	37	54	70	87	105	29
SUBTOTAL		46	54	17	74	105	139	178	217	32
FACILITIES MANAGEMENT	GEN. BUS.	–	–	–	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	5	6	20	8	11	15	20	26	34
	UTILITY	19	21	11	23	26	29	31	33	9
SUBTOTAL		24	27	13	31	37	44	51	59	17
BATCH	GEN. BUS.	10	11	10	12	13	14	15	16	8
	SCI. & ENG.	–	–	–	–	–	–	–	–	–
	IND. SPEC.	10	11	10	16	23	28	33	38	28
	UTILITY	35	36	3	37	37	38	38	39	2
SUBTOTAL		55	58	5	65	73	80	86	93	10
TOTAL PROCESSING	GEN. BUS.	20	23	15	29	34	43	54	65	23
	SCI. & ENG.	5	5	9	8	12	17	22	27	40
	IND. SPEC.	22	25	14	36	52	66	83	100	32
	UTILITY	78	86	10	97	117	137	156	177	16
TOTAL		125	139	11	170	215	263	315	369	22
SOFTWARE PRODUCTS	SYSTEM	46	55	20	66	79	95	114	137	20
	APPLICATION	12	15	25	17	19	22	25	29	14
TOTAL		58	70	21	83	98	117	139	166	19
PROFESSIONAL SERVICES		142	169	19	194	224	258	299	345	15
GRAND TOTAL		$ 325	$ 378	16%	$ 447	$ 537	$ 638	$ 753	$ 880	18%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Facilities management is growing slightly faster than the overall industry average. This reflects the recognition by state and local governments of the need for professional data processing management.

- Over 60% of all processing services are derived from utility processing. Although this percentage will decline to approximtely 50% by 1984, the utility type of service will still represent the largest segment of the processing services market.

- Software product opportunities are not significant in this market segment. The 19% overall growth rate in software products (14% in applications software products) and the relatively small market size ($70 million in 1979), make this industry sector unattractive from a software product perspective.

- Professional services are growing at a 15% annual rate which is four percentage points lower than the overall industry average. State and local governments don't have the funds available to purchase their services.

- The RCS market in state and local governments is growing faster than in any other industry. The market size will exceed $200 million by 1984, growing from a $54 million base today, implying a 32% average annual growth rate.

C. EDP USAGE

- INPUT did not send questionnaires for the user panel to state and local government installations.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

D. VENDOR ACTIVITIES

- American Management Systems (AMS) has developed a new financial management system for local governments that offer the full capabilities of a custom designed system at the price of a computer software package. Known as LGFS (for Local Government Financial System), the system provides an alternative to local governments that cannot afford the time and costs involved in developing their own computer based financial management systems, but at the same time, cannot accept the limitation of commercially oriented accounting packages.

  - LGFS conforms to the user's existing standards and procedures, and offers a wide range of options. Local governments may select functions to be performed by LGFS: accrual, modified accrual or cash basis; the extent to which expense budgets or allotments limit actual spending; the level of detail for budgeting, planning and accounting; duration of accounting cycles; the frequency of close-outs and financial reporting; the periods of time for which plans and/or allotments are established; procedures for allocating indirect costs; and the use or non-use of vendor codes on purchase transactions.

  - The operating environments are Digital PDP-11/34 through 11/70 under RSX-11M; IBM 360/370/303X under DOS/VS, OS, MVS; CICS.

- Computer Task Group (CTG) has been responsible for the general and detailed design and documentation of the EMPIRE system (Erie Municipal Police Information Retrieval Enhancement), which permits 29 Erie County police agencies the use of a central computer facility. This system provides on-line entry and access to local files (Arrest, Incidents, Warrants, Wants, Stolen Property, etc.) CTG has implemented a CPU-CPU interface with the New York State Police Information Network (NYSPIN). The interface, in turn, permits local, controlled access to State Police, Department of Motor Vehicles (DMV), State Criminal Records, Department of Criminal Justice Services

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

(DCJS), National Crime Information Center (NCIC) files and to the NLETS network. CTG was responsible for making recommendations for central site hardware, software, terminal hardware, and design of the communications network. The EMPIRE system runs on the Univac 9060.

- Complete Computer Systems offers a turnkey system for municipal governments.

  - The system handles tax billing and follow-up, licensing, vehicle and street maintenance, parking violations, purchasing, payroll, and general ledger.

  - Using a Data General minicomputer, the system also includes the companys' CREATE capability, which allows users to create special programs without delay or special programming.

  - Including a minicomputer, disk drive, printers, CRT terminals, and software, the system price starts at $48,995. It can handle up to 33 terminals.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XVI SERVICES INDUSTRY SECTOR MARKETS

XVI SERVICES INDUSTRY SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- Although total revenues for this sector total only approximately $75 billion per year, it is an important computer services market due largely to the high information (paper handling) content of the work done by the subsector groups.

- The average establishment in the business services sector has 11 employees, as Exhibit XVI-1 shows.

  - Legal services firms and accounting, auditing, and bookkeeping companies have the lowest average number of employees, with four and seven respectively.

  - Engineering and architectural services firms are slightly larger with an average of 12 employees.

  - Non-commercial research organizations have the largest average number of employees of the subsectors (30).

- The variation in revenue production per employee is dramatic between subsectors.

  - Business services firms generate an average of $7,000 per employee.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XVI-1

SERVICES INDUSTRY SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	ESTIMATED REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 286,957 3.1 MILLION
73	BUSINESS SERVICES	ESTIMATED REVENUES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$14.0 BILLION 133,804 2.1 MILLION
81	LEGAL SERVICES	ESTIMATED REVENUES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$15.0 BILLION 85,758 363,088
891	ENGINEERING AND ARCHI-TECTURAL SERVICES	ESTIMATED REVENUES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$18.0 BILLION 29,468 345,003
893	NON-COMMERCIAL RESEARCH ORGANIZATIONS	ESTIMATED REVENUES (1976) NUMBER OF ESTABLISHMENTS 1976) NUMBER OF EMPLOYEES (1976)	$19.0 BILLION 2,349 60,357
893	ACCOUNTING, AUDITING AND BOOKKEEPING	ESTIMATED REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$9.0 BILLION 32,657 218,534
899	SERVICES (N.E.C.)	ESTIMATED REVENUES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	- 2,921 14,924

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Legal services companies and accounting, auditing, and bookkeeping firms generate an average of $41,000 per employee.

- Non-commercial research organizations generate over $300,000 per employee.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- The computer services market in the services industry closely parallels the overall computer services market in terms of growth rate and product mix, as shown in Exhibit XVI-2.

- With regard to type of service, industry specialty accounts for nearly one-half of processing services revenues.

  - Tax processing is the dominant industry specialty.

  - Legal search services are growing.

  - Scientific and engineering services, primarily structural analysis, will grow at a modest but solid 12% rate.

  - Utility based RCS services will grow at the same 19% rate as general business, with DBMS based services being strong.

- Software products are growing at the overall industry average of 29%.

- Professional services and FM are insignificant in this sector. Services companies either do it themselves or buy a packaged service.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XVI-2

COMPUTER SERVICES MARKET FORECAST - SERVICES INDUSTRY SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 18	$ 22	20%	$ 28	$ 35	$ 42	$ 49	$ 56	21%
	SCI. & ENG.	82	91	11	102	114	130	149	168	13
	IND. SPEC.	56	70	25	88	109	137	171	214	25
	UTILITY	34	41	21	53	68	85	103	125	25
SUBTOTAL		190	224	18	271	326	394	472	563	20
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	-	-	-	-	-	-	-	-	-
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		-	-	-	-	-	-	-	-	-
BATCH	GEN. BUS.	34	40	18	46	54	64	76	90	18
	SCI. & ENG.	12	13	6	13	13	13	13	13	0
	IND. SPEC.	125	146	17	186	200	210	210	210	8
	UTILITY	15	18	20	18	18	18	18	18	0
SUBTOTAL		186	217	17	263	285	305	317	331	9
TOTAL PROCESSING	GEN. BUS.	52	62	19	74	89	106	125	146	19
	SCI. & ENG.	94	104	11	115	127	143	162	181	12
	IND. SPEC.	181	216	19	274	309	347	381	424	14
	UTILITY	49	59	20	71	86	103	121	143	19
TOTAL		$ 376	$ 441	17%	$ 534	$ 611	$ 694	$ 789	$ 894	15%
SOFTWARE PRODUCTS	SYSTEM	$ 12	$ 16	33%	$ 21	$ 29	$ 38	$ 52	$ 69	34%
	APPLICATION	21	28	31	35	44	56	71	89	26
TOTAL		$ 33	$ 44	33%	$ 56	$ 73	$ 94	$ 123	$ 158	29%
PROFESSIONAL SERVICES		11	13	18	15	18	21	25	30	18
GRAND TOTAL		$ 420	$ 498	18%	$ 605	$ 702	$ 814	$ 937	$1,082	17%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

C. EDP USAGE

- There were not enough respondents to the user panel questionnaire in this industry sector to separately highlight the profile of the EDP manager. EDP manager respondents in this industry sector were grouped with respondents in the education industry, medical industry, and other miscellaneous industries which are not separately tracked. The results are presented in Chapter XVII.

D. VENDOR ACTIVITIES

- Aspen Systems Corporation and West Publishing Company have entered into a joint marketing agreement to offer a computerized legal system named WESTLAW.

  - The system combines West's legal research system and Aspen's litigation support system.

  - It allows instant research of all reported opinions of the U.S. Supreme Court from 1932 onward, the opinions of all federal courts since 1961, and reported opinions of all state courts since 1978.

  - The system utilizes Aspen's Aspenet timesharing network.

  - Access is through a CRT terminal.

- Comptek Research, Inc. offers the Barrister/300, a financial management and word processing system for lawyers.

  - The word processing capability is based on Comptek's Accutext system, a shared logic system configured on a Data General Nova 3 minicomputer.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Barrister/300 provides a time and disbursement accounting system that covers accounts receivable aging, trial balance, disbursement register, monthly billing register, client directory, and other applications.

- Information Sytems announced a time accounting system for the legal profession. Interactive processing services are provided to the clients.

- 21st Century Software's Legal Time Accounting (LTA) system provides law offices with a timekeeping system. It organizes client and matter information, maintains logs and client balances, generates bills, and provides reporting capabilities.

  - The command-driven package runs on the PolyMorphic 8813 desk top microcomputer and will handle the workload of up to 12 attorneys.

  - Price is $800; complete hardware and software systems start at about $300 per month.

- Dylakor Software Systems, Inc. has introduced a new auditing concept called DYL-AUDIT.

  - DYL-AUDIT combines an auditing and accounting function with DYL-260, Dylakor's file management sytem. DYL-260 is in use by most of the "Big 8" CPA firms. The total system provides such applications as aging analysis, frequency distribution, and file handling. In the aging function, for example, DYL-AUDIT automatically calculates the number of days between dates, buckets the amount in the appropriate age group, and then produces either a detailed or summary aging report.

  - DYL-AUDIT is available for both IBM DOS and OS shops. It is currently being tested by the Los Angeles Department of Water and Power.

- ExperTax offers a tax preparation service to accountants, attorneys, and other individuals.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- For a fee of $37.50, the firm will print information on government tax forms and computes a refund or liability payment.

- The service runs on an IBM 360 under DOS.

- American Management Systems (AMS) has introduced a Project Account and Billing System (PABS), an on-line, integrated financial system designed for engineering and other professional service firms that are project, job, or grant oriented. Included are project accounting and billing, employee accounting, accounts receivable, accounts payable, and general ledger capabilities. PABS provides financial project control as well as cash management and general management accounting capabilities.

  - PABS handles cost plus fixed fee, time and materials, and fixed fee contracts. Loading factors can be used automatically where appropriate. The system comes complete with over 25 standard reports that can be changed easily. In addition, a report writer is provided, enabling the user to design and request "custom" reports.

  - Operating environments are Digital PDP-11/34 through 11/70 under RSX-11M; IBM 360/370/303X under OS/VS, OS, MVS; CICS.

- Fisher-Stevens has introduced a processing service for media surveys. The service measures direct mail compaign awareness among recipients of the direct mail piece.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

XVII OTHER INDUSTRIES SECTOR MARKETS

XVII OTHER INDUSTRIES SECTOR MARKETS

A. INDUSTRY CHARACTERISTICS

- This sector, which includes everything that is not included in the 13 previously described sectors, is a mix of widely differing subsectors, as shown in Exhibit XVII-1.

  - Construction is a large subsector, dominated by large international companies like Bechtel and Fluor.

  - Auto repair is an example of a much smaller subsector with many small vendors.

  - Agriculture, forestry, and fishing have high revenues but are characterized by a relatively small use of information services; this is changing as agribusiness grows.

- Several subsectors, notably hotels, personal services, motion pictures, and recreation provide an entry point to consumer services.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XVII-1

OTHER INDUSTRIES SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
ALL	ALL	SALES NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$422 BILLION 1.3 MILLION 9.6 MILLION
01-09	AGRICULTURE, FORESTRY, FISHING	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$101.0 BILLION 42,699 227,505
15-17	CONSTRUCTION	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$161.1 BILLION 394,963 3.4 MILLION
65	REAL ESTATE	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$88.6 BILLION 166,275 819,474
66	REAL ESTATE, INSURANCE	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$247 MILLION 7,326 29,317
70	HOTELS, ETC.	SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$12.2 BILLION 46,122 890,512
72	PERSONAL SERVICES	SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$16.7 BILLION 159,719 880,718
75	AUTO REPAIR	SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$19.0 BILLION 91,653 444,165
76	MISCELLANEOUS REPAIR	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$6.0 MILLION 47,874 242,767

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XVII-1 (CONT.)

OTHER INDUSTRIES SECTOR -
DEMOGRAPHIC DATA

INDUSTRY SIC	INDUSTRY NAME	TYPE OF STATISTIC	DATA
78	MOTION PICTURES	SALES (1976) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$3.0 BILLION 14,748 184,607
79	RECREATION	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$8.7 MILLION 44,903 563,380
83	SOCIAL SERVICES	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$2.9 BILLION 43,036 723,119
84	MUSEUMS, ETC.	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$150 MILLION 871 23,398
86	MEMBERSHIP ORGANIZATIONS	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$12.2 BILLION 135,628 1.1 MILLION
99	NON-CLASSIFIABLE	SALES (1975) NUMBER OF ESTABLISHMENTS (1976) NUMBER OF EMPLOYEES (1976)	$4.8 BILLION 82,951 112,621

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

B. COMPUTER SERVICES MARKET FORECASTS, 1979-1984

- Of all sectors, the "other" category retains the most dominant position for batch services, reflecting the continued use of these services by local or decentralized subsectors, such as auto repair and recreation.

  - Details of the forecast are presented in Exhibit XVII-2 which show batch services to be 56% of total processing services in 1979.

  - RCS is growing and will equal batch after 1983 as subsectors such as hotel/motel, real estate, and advertising demand more timely information processing.

- Software products show continued strong growth from a small base. Applications products tailored to individual subsectors have been successfully marketed: for example, engineering packages in the construction industry.

- Agriculture has market potential for services but the market is hampered by services offered at reduced rates or at no charge by federal, state, and local agencies and by colleges, particularly "agricultural" colleges.

- Industry specialty applications delivered in an RCS mode have high growth potential, particularly in subsectors which are currently more highly automated, such as advertising and construction.

C. EDP USAGE

- INPUT's 1979 user panel includes 54 EDP managers in the education industry, medical industry, services industry, and other miscellaneous industries which are not separately tracked. Their responses to a detailed questionnaire are the basis for this section.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XVII-2

COMPUTER SERVICES MARKET FORECAST -
OTHER INDUSTRIES SECTOR, 1979-1984

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 8	$ 9	15%	$ 10	$ 12	$ 14	$ 16	$ 18	15%
	SCI. & ENG.	27	30	11	37	44	54	65	76	20
	IND. SPEC.	22	27	24	34	39	53	64	75	23
	UTILITY	48	58	20	70	84	99	117	138	19
SUBTOTAL		105	124	18	151	179	220	262	307	20
FACILITIES MANAGEMENT	GEN. BUS.	-	-	-	-	-	-	-	-	-
	SCI. & ENG.	-	-	-	-	-	-	-	-	-
	IND. SPEC.	7	7	3	8	9	10	11	12	11
	UTILITY	4	4	8	5	6	8	10	12	11
SUBTOTAL		11	11	4	13	15	18	21	24	17
BATCH	GEN. BUS.	58	58	0	63	70	79	90	112	14
	SCI. & ENG.	17	17	0	17	18	18	18	18	1
	IND. SPEC.	85	86	1	104	117	129	145	162	14
	UTILITY	13	14	8	14	15	15	16	16	3
SUBTOTAL		173	175	2	198	220	241	269	308	12
TOTAL PROCESSING	GEN. BUS.	66	67	2	73	82	93	106	130	14
	SCI. & ENG.	44	47	7	54	62	72	83	94	15
	IND. SPEC.	114	120	5	146	165	192	220	249	16
	UTILITY	65	76	17	89	105	122	143	166	17
TOTAL		289	310	7	362	414	479	552	639	16
SOFTWARE PRODUCTS	SYSTEM	13	19	46	29	43	65	99	150	51
	APPLICATION	22	27	23	35	46	61	80	104	31
TOTAL		35	46	31	64	89	126	179	254	41
PROFESSIONAL SERVICES		54	64	19	78	95	116	142	173	22
GRAND TOTAL		$ 378	$ 420	11%	$ 504	$ 598	$ 721	$ 873	$1,066	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- EDP managers purchased 4% less outside services in 1978 than the overall industry average.

  - This mixed industry group spends less on contract programming, but more on hardware maintenance than do most other industries.

  - The purchase of outside services between 1978 and 1979 is estimated by EDP managers to remain unchanged, as shown in Exhibit XVII-3.

    This is probably a conservative estimate based on EDP managers' usage in the past.

D. VENDOR ACTIVITIES

- American Airlines acquired a travel agency turnkey systems vendor, Agency Data Systems, this year.

  - The turnkey system handles all aspects of travel agency data processing from reservations to accounting to government reporting.

  - The turnkey system operates on Data General computers.

- Complete Computer Systems announced a property management system for both residential and commercial properties.

  - The system is targeted for prospects that manage more than 2000 units.

  - The system provides information about each tenant, as well as a complete tenant payment history.

  - The system operates on Data General and Prime computers.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT XVII-3

AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE IN THE EDUCATION, MEDICAL, SERVICES, AND OTHER INDUSTRIES SECTOR

TYPE OF SERVICE	1978 EXPENDITURES ($000)		1979 EXPENDITURES ($000)		AVERAGE PERCENT CHANGE-INCREASE (DECREASE)	
	RANGE	AVERAGE	RANGE	AVERAGE	1978-1979	1979-1980
PROCESSING SERVICES						
INTERACTIVE	$ 0-750	$ 21	$ 0-60	$ 3	(87%)	(3%)
REMOTE BATCH	0-445	6	0-435	6	-	-
BATCH	0-200	7	0-200	4	(46)	(3)
INPUT/OUTPUT	0-460	16	0-326	13	(21)	3
SOFTWARE PRODUCTS						
SYSTEMS SOFTWARE	0-220	24	0-304	35	44	3
APPLICATIONS SOFTWARE	0-250	25	0-200	13	(48)	4
PROFESSIONAL SERVICES						
CONTRACT PROGRAMMING	0-240	12	0-198	11	(6)	-
EDP CONSULTING	0-40	3	0-350	11	340	-
EDUCATION	0-100	7	0-50	5	(37)	3
OTHER	0-13	-	0-100	2	701	-
FACILITIES MANAGEMENT	0-70	2	0-100	2	43	-
MAINTENANCE						
HARDWARE	0-360	55	0-432	55	-	2
SOFTWARE	0-60	4	0-200	12	204	1
TOTAL OUTSIDE SERVICES EXPENDITURES	$5-1,190	$182	$1-800	$172	(5)%	-

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Computer Task Group's Service Bureau Division has developed a data processing service designed specifically to meet the needs of fund raising organizations. The system provides fund raisers with a fully computerized system to classify, retain, and communicate with contributors in a personal and individual manner. It features complete contributor analysis, individual subscription histories, mailing labels, and fund accounting.

- Construction Information Systems announced an interactive computer processing service for the construction industry within the last 12 months. The system operates on a Microdata minicomputer.

- Contruction Data Systems sells a turnkey system to electrical and mechanical contractors.

  - The system handles job cost control and job cost estimating.

  - The system is DEC PDP-11 based. Although currently priced at $100,000, scaled down versions will soon be available at $15,000 to $30,000.

- Management and Computer Services, Inc. offers a Property Management Department (PMD) package for residential property management.

  - The product is written in RPG-11 for use on the IBM System/32.

  - PMD provides tenant status reports, income statements and summaries, disbursements by general ledger account, cash collection reports and other output.

  - Source code for the System/32 implementation costs $6,150.

- RAND Information Systems announced the purchase, in May 1979, of the assets of Specialized Computer Service for cash and notes.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The new acquisition, renamed RAND Travel Services, provides data processing services exclusively to travel agencies. It will market the Travel Agency Computer System (TRACS), which supports five accounting areas for travel agencies.

- Annual revenues of the organization, located in Palo Alto, California, are expected to be about $300,000. The operation will be part of RAND's Data Service Group, which accounts for approximately 25% of RAND's total revenues.

- ITT has delivered a Honeywell Level 6 airline reservation system to travel agents. The system competes directly with similar systems from United Airlines and American Airlines.

- Sperry Univac announced software products for a number of industries in this mixed group. Two of the more significant announcements included:

  - Hotel reservations system.

  - Airline fare determination and ticketing system.

- Systems Data Processing announced a new batch system for the construction industry. The system processes payroll and job accounting.

- Hotels and motels are also moving heavily into data processing.

  - Hyatt Hotels use a Datapoint system to handle front desk accounting. Eventually all processing for each hotel will be done on its premises.

  - NCR has recently announced a front desk accounting system for smaller hotels and motels. The microprocessor based system costs less than $7,000.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

COMPUTER SERVICES

- These are services provided by vendors which perform data processing functions using vendor computers (processing services) or assist users to perform such functions on their own computers (software products and/or professional services).

- The following are definitions of the modes of service used in this report:

  - Remote Computing Services. Provision of data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. The three submodes of RCS are:

    . Interactive (timesharing) is characterized by interaction of the user with the system, primarily for problem solving timesharing but also for data entry and transaction processing: the user is on-line to the program/files.

    . Remote Batch is where the user hands over control of a job to the vendor's computer which schedules job execution according to priorities and resource requirements.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

. Date Base inquiry is characterized by the retrieval of information from a vendor maintained data base. This may be owned by the vendor or a third party.

. User Site Hardware Services (USHS). These are offerings, typically provided by RCS vendors, which place programmable hardware on the user site (as compared to the EDP center). USHS offers:

  - Access to a communications network.

  - Access through the network to the RCS vendor's larger computers.

  - Significant software as part of the service.

- Batch Services. This includes data processing performed at vendors' sites of user programs and/or data which are physically transported (as opposed to electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and COM processing, are also included. Batch services include those expenditures by users which take their data to a vendor site which has a terminal connected to a remote computer used for the actual processing.

- Facilities Management (FM). (Also referred to as "Resource Management" or "Systems Management.") The management of all or part of a user's data processing functions under a long-term contract (not less than one year). To qualify as FM, the contractor must directly plan and control as well as operate the facility provided to the user on-site through communications lines or mixed mode. Simply providing resources, even though under a long-term contract, and/or providing for all of a users' processing needs, does not necessarily qualify as FM.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Turnkey System. A combination of hardware and software integrated into a total system designed to completely fulfill the processing requirements of an application (or applications) for a user.

PROCESSING SERVICES

- Processing services encompass facilities management, remote computing services, and batch services. They are categorized by type of services bought by users as follows:

  - General Business services are processing services for applications which are common to users across industry categories. Software is provided by the vendor; this can be a complete package, a payroll package, or an applications "tool," such as a budgeting model, where a user provides much of the customizing of the finished product it uses. General business processing is often repetitive and transaction oriented.

  - Scientific and Engineering services are the processing of scientific and engineering problems for users across industries. The problems usually involve the solution of mathematical equations. Processing is generally problem solving and is non-repetitive, except in the sense that the same packages or "tools" are used to address different, but similar, problems.

  - Industry Specialty services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications "tool" which the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation; data base services, where the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry specialty applica-

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

tions are: seismic data processing, numerically-controlled machine tool software development, and demand deposit accounting.

- Utility services are those where the vendor provides access to a computer and/or communications network with basic software that enables any user to develop its own problem solution or processing system. These basic tools include terminal handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

PROFESSIONAL SERVICES

- This category is made up of services related to EDP, including system design, custom/contract programming, consulting, education, and training. Services are provided on the basis of:

  - Time and Materials - The billing rate is measured in units of time, rather than actual costs.

  - Fixed Price - A firm price is agreed upon for a defined piece of work.

  - Cost Plus Fee - The billing rate depends on actual costs plus a fixed fee.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

SOFTWARE PRODUCTS

- This category includes user's purchase of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package at the users' site(s). Fees for work performed by organizations other than the package vendor are counted in professional services. The subcategories of software products are:

  - Application Products are software which perform processing to serve user functions. They consist of:

    . Cross-industry products which are used in multiple user industry sectors. Examples are payroll, inventory control, and financial planning.

    . Industry specialized products which are used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.

  - System Products are software that enable the computer/communications system to perform basic functions. They consist of:

    . System operations products which function during applications program execution to manage the computer system resource. Examples include operating systems, DBMS, communication monitors, emulators, and spoolers.

    . System utilization products which are used by operations personnel to utilize the computer system more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- System implementaiton products which are used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include languages, sorts, productivity aids, data dictionaries, report writers, project control systems, program library management systems, and retrieval systems.

- All expenditures and revenues addressed are "available" in that they are open for competition. "Captive" figures, which refer to expenditures by a user for services from a subsidiary company, such as Boeing Aircraft with Boeing Computer Services (BCS), are not included. They may be referred to when examining an individual "spin-off" vendor, such as BCS.

- When any questions arise as to the place to properly count certain user expenditures, INPUT addresses the questions from the user viewpoint and categorizes the expenditures according to the answer to the question "What does the user perceive it is buying"?

- Industry sectors used in this report are defined in Exhibit A-1.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT A-1

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
DISCRETE MANUFACTURING	23	APPAREL
	25	FURNITURE
	27	PRINTING
	31	LEATHER
	34	METAL
	35	MACHINERY
	36	ELECTRONICS
	37	TRANSPORTATION
	38	SCIENTIFIC AND CONTROL INSTRUMENTS
	39	MISCELLANEOUS MFG.
PROCESS MANUFACTURING	10	METAL MINING
	11	ANTHRACITE MINING
	12	COAL MINING
	13	OIL AND GAS EXTRACTION
	20	FOOD PRODUCTS
	21	TOBACCO
	22	TEXTILE PRODUCTS
	24	LUMBER AND WOOD PRODUCTS
	26	PAPER PRODUCTS
	28	CHEMICALS
	29	PETROLEUM
	30	RUBBER AND PLASTICS
	32	STONE, GLASS, CLAY
	33	PRIMARY METALS

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT A-1 (CONTD.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
EDUCATION	82	EDUCATIONAL SERVICES
RETAIL	52	BUILDING MATERIALS, HARDWARE
	53	GENERAL MERCHANDISE
	54	FOOD
	55	AUTOMOTIVE AND GAS STATIONS
	56	APPAREL
	57	FURNITURE
	58	EATING AND DRINKING
	59	MISCELLANEOUS RETAIL
WHOLESALE	50	DURABLE GOODS
	51	NON-DURABLE GOODS
STATE AND LOCAL GOVERNMENT	91-97	AS APPROPRIATE
FEDERAL GOVERNMENT	91-97	AS APPROPRIATE
SERVICES	73	BUSINESS SERVICES

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

INP

EXHIBIT A-1 (CONTD.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
TRANSPORTATION	40	RAILROADS
	41	LOCAL TRANSIT
	42	MOTOR FREIGHT
	43	U.S. POSTAL SERVICE
	44	WATER TRANSPORTATION
	45	AIR
	46	PIPELINES
	47	TRANSPORTATION SERVICES
UTILITIES	48	COMMUNICATIONS
	49	ELECTRIC, GAS,& SANITARY
BANKING AND FINANCE	60	BANKS
	61	CREDIT AGENCIES
	62	SECURITY AND COMMODITY BROKERS
	67	HOLDING AND INVESTMENT OFFICES
INSURANCE	63	INSURANCE (LIFE, HEALTH, ETC.)
	64	INSURANCE AGENTS
MEDICAL	80	HEALTH SERVICES

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EXHIBIT A-1 (CONTD.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
OTHER INDUSTRIES	01-09	AGRICULTURE, FORESTRY, AND FISHING
	15-17	CONSTRUCTION
	65	REAL ESTATE
	66	COMBINATIONS OF REAL ESTATE, INSURANCE, LOANS, LAW OFFICES
	70	HOTELS, ROOMING HOUSES, CAMPS, AND OTHER LODGING PLACES
	72	PERSONAL SERVICES
	75	AUTOMOTIVE REPAIR, SERVICES, AND GARAGES
	76	MISCELLANEOUS REPAIR SERVICES
	78	MOTION PICTURES
	79	AMUSEMENT AND RECREATION SERVICES, EXCEPT MOTION PICTURES
	83	SOCIAL SERVICES
	84	MUSEUMS, ART GALLERIES, BOTANICAL AND ZOOLOGICAL GARDENS
	86	MEMBERSHIP ORGANIZATIONS
	89	MISCELLANEOUS SERVICES

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B: CURRENT STATUS OF IN-HOUSE EDP IN MAJOR COMPANIES AND INSTITUTIONS

APPENDIX B: CURRENT STATUS OF IN-HOUSE EDP IN MAJOR COMPANIES AND INSTITUTIONS

A. DESCRIPTION OF INPUT'S USER PANEL

- 1979 marks the second year of INPUT's user panel. Based on a detailed questionnaire, data was obtained which reflected not only the current status but also the anticipated direction of in-house EDP. A copy of this questionnaire is included in Appendix G of this report. The interview profile of the respondents is included in Appendix G.

B. OBJECTIVES, APPLICATIONS PLANS, EXPENDITURE PATTERNS

- Respondents were asked to state their goals for the period 1979-1981. From their comments, objectives were categorized and the results are displayed in Exhibit B-1.

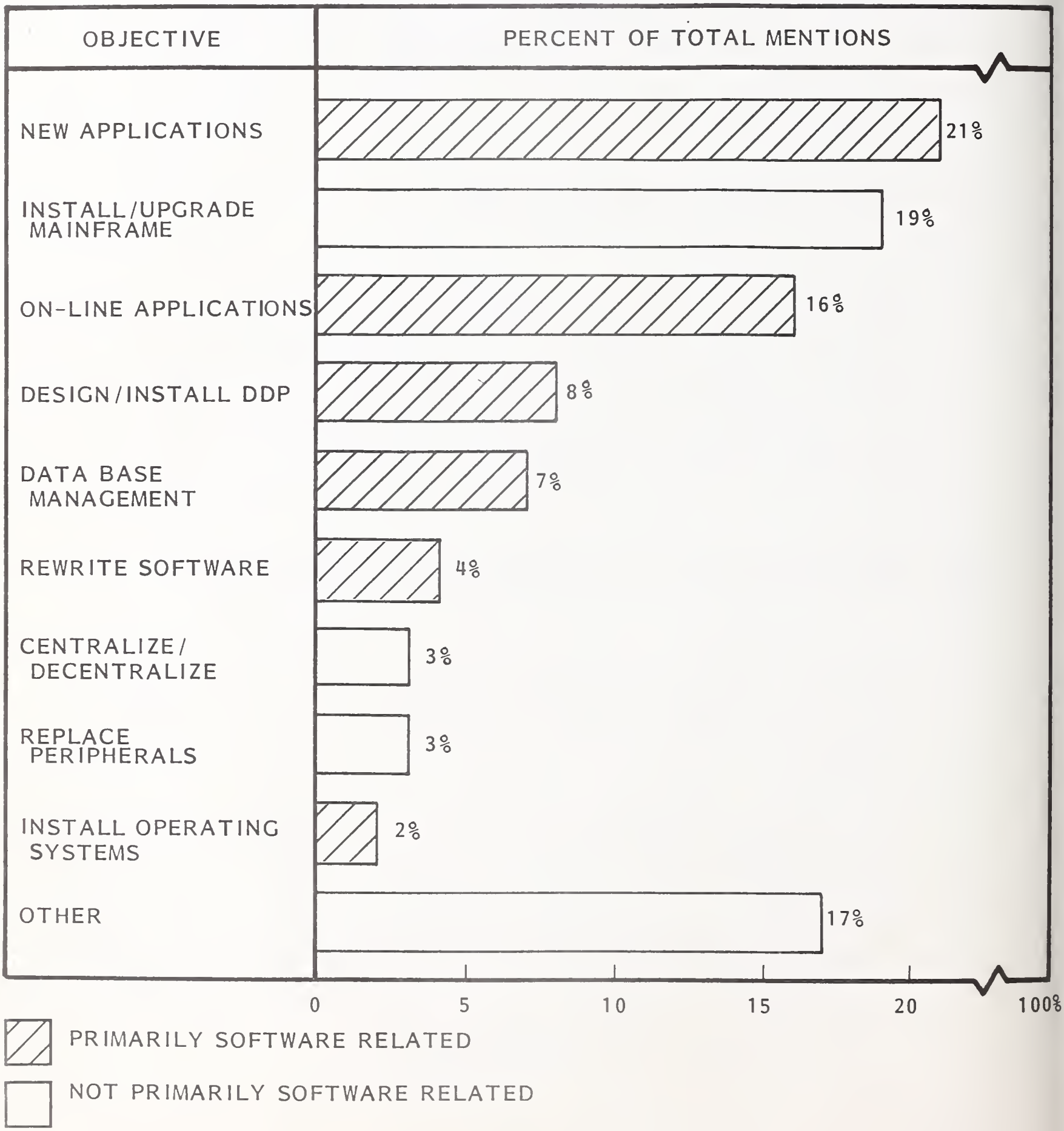
  - Software is of paramount importance: 58% of the total responses are software oriented.

  - Over the last year the development of new applications has become the EDP managers' prime objective. End users are becoming more sophisticated and demand software that is reliable, easy to use, and specific to their functional orientation.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-1

1979 EDP OBJECTIVES
AVERAGE FOR ALL INDUSTRY SECTORS



© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The pressure for on-line applications is still great. Users are demanding greater and faster access to information. There is a rapid growth in the number of on-line terminals that are being installed across industry lines. Exhibit B-2 presents the development of new applications and on-line applications as a percentage of total EDP objectives.

- Although distributed data processing has penetrated all industry sectors, as shown in Exhibit B-3, EDP managers do not consider it as a primary objective within the 1979-1980 time frame.

  - Disillusionment with the concept stems from lack of software to facilitate DDP. This means that the EDP manager must develop software internally to solve the DDP problem.

  - New application systems and on-line applications are keeping the development programming staff busy so that very few resources are available to pursue DDP.

  - DDP will be in widespread use after 1983, but the near term outlook is for remote processing and central processing without a true DDP design.

  - EDP managers have ordered tremendous quantities of IBM 8100s and 4300s that are certainly capable of performing in a DDP mode. However, since DDP will not be implemented by the majority of companies until after 1983, the 8100s and 4300s, if accepted for delivery, will be used for remote location processing rather than DDP.

- Industries where large companies or companies with multiple locations are dominant are the best targets for DDP.

  - Discrete manufacturing.

  - Process manufacturing.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-2

DEVELOPMENT OF NEW APPLICATIONS AND ON-LINE APPLICATIONS AS PERCENTAGE OF TOTAL EDP OBJECTIVES

INDUSTRY SECTOR	PERCENT OF MENTIONS BY RESPONDENTS		
	1979	1980	1981
DISCRETE MANUFACTURING	42%	32%	42%
PROCESS MANUFACTURING	34	30	32
TRANSPORTATION	58	38	37
UTILITIES	20	43	20
WHOLESALE	55	41	42
RETAIL	51	43	31
BANKING AND FINANCE	32	26	24
INSURANCE	42	32	28
SERVICES AND OTHER	32	34	41
AVERAGE	41%	35%	33%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-3

RESPONDENT INVOLVEMENT IN DISTRIBUTED DATA PROCESSING

INDUSTRY SECTOR	PERCENTAGE OF RESPONDENTS			
	DDP INSTALLED 1978	DDP UNDER CONSIDER-ATION 1978	DDP INSTALLED 1979	DDP PLANNED BY 1983
DISCRETE MANUFACTURING	22%	53%	35%	57%
PROCESS MANUFACTURING	36	40	45	54
TRANSPORTATION	0	67	33	50
UTILITIES	9	73	33	61
WHOLESALE	0	75	25	63
RETAIL	13	38	15	23
BANKING AND FINANCE	17	50	27	36
INSURANCE	17	50	13	33
SERVICES AND OTHER	17	50	17	40
AVERAGE	15%	55%	27%	46%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Transportation.

- Utilities.

- Wholesale industry respondents indicated the highest level of involvement of all industries for DDP planned by 1983.

  - However, the respondents cannot be considered to be representative of the industry. The size of respondent companies places them in the top 1% of the industry.

  - Most small wholesalers will not see value in DDP, because like small retailers and service establishments, they are generally single location operations.

- Managers reflected a considerable degree of consistency with respect to objectives. The same was not so true with applications to be developed.

  - Exhibit B-4 shows that insurance, banking, services, and discrete manufacturing are concerned with industry specific applications.

  - Accounting and finance application development was rated important in all industry sectors, except insurance and banking and finance.

    . Nearly 50% of the mentions by respondents were for accounting and finance applications.

    . The insurance and banking and finance industries were the exceptions with only 20% of the respondents mentioning application development in these areas. This indicates that these two industries have already solved the accounting/finance problems or look to outside software to solve the problems, or both.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-4
APPLICATIONS TO BE DEVELOPED BY RESPONDENTS

APPLICATION	INDUSTRY SECTOR										
	DISCRETE MANUFAC-TURING	PROCESS MANUFAC-TURING	TRANS-PORTA-TION	UTILITIES	WHOLE-SALE	RETAIL	INSURANCE	BANKING AND FINANCE	SERVICES AND OTHER	TOTAL NUMBER OF MENTIONS	PERCENT OF MENTIONS
ACCOUNTING/FINANCE	18	18	2	6	4	3	9	6	17	83	17%
COST SYSTEMS	4	5	–	1	–	–	3	–	2	15	3
INVENTORY CONTROL	12	9	1	1	5	2	–	2	3	35	7
ORDER ENTRY	17	14	1	4	4	2	–	1	4	47	10
PERSONNEL/PAYROLL	8	9	1	1	1	2	2	2	7	33	7
PURCHASING	4	3	–	1	1	1	–	–	2	12	2
MARKETING/SALES	6	4	–	–	1	–	2	–	–	13	3
MODELING/FORE-CASTING	2	2	1	1	1	–	–	–	1	8	2
COMMUNICATIONS	1	–	–	–	–	–	–	–	1	2	–
GRAPHICS	–	–	–	–	–	–	–	–	1	1	–
SCIENTIFIC/ENGINEER-ING	–	1	–	1	–	–	–	–	1	3	1
DATA BASE	2	2	1	1	–	–	3	4	3	16	3
WORD PROCESSING	–	–	–	–	–	–	–	–	1	1	–
PERFORMANCE MEASUREMENT	–	1	–	1	–	–	–	–	1	3	1
OTHER INDUSTRY SPECIFIC	36	29	5	10	3	10	44	39	38	214	44
TOTAL	110	97	12	28	20	20	63	54	82	486	
PERCENT	23%	20	2	6	4	4	13	11	17	–	100%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Data base applications are of the highest priority in the insurance and banking areas.

- Interestingly, electronic mail is only rated high by the retail sector, and word processing by the services sector. This underlines the point that automated office services seem to be falling more to the purview of end users rather than to EDP managers.

- Discrete and process manufacturing and wholesale distribution give a high priority to order entry applications.

- Scientific and engineering applications are a low priority in all sectors.

- Exhibit B-5 shows the applications development priority ranking by respondents. These figures parallel the data in Exhibit B-4.

- Approximately one-half of the respondents are looking for applications software to aid in problem solving, as shown in Exhibit B-6.

  - The process manufacturing and banking and finance industries are much more prone to acquire applications software packages.

  - The wholesale industry is much less inclined to purchase applications software packages.

- To reduce the time and cost of application development, respondents indicated that they would favor increased use of purchased software products and more on-line programming. Findings are presented in Exhibit B-7.

  - As shown in Exhibit B-8, personnel availability was regarded as the most critical EDP problem to be faced.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-5
APPLICATIONS GIVEN HIGHEST PRIORITY

APPLICATION	INDUSTRY SECTOR										
	DISCRETE MANUFAC-TURING	PROCESS MANUFAC-TURING	TRANS-PORTA-TION	UTILITIES	WHOLE-SALE	RETAIL	INSURANCE	BANKING AND FINANCE	SERVICES AND OTHER	TOTAL NUMBER OF MENTIONS	PERCENT OF MENTIONS
ACCOUNTING/FINANCE	13	18	1	2	5	1	4	5	17	66	14%
COST SYSTEMS	2	3	1	1	–	–	1	–	2	10	2
INVENTORY CONTROL	13	8	1	1	4	3	–	2	3	35	7
ORDER ENTRY	21	24	4	6	8	4	1	1	2	71	15
PERSONNEL/PAYROLL	4	5	1	2	1	1	2	1	6	23	5
PURCHASING	6	1	–	–	1	1	–	–	2	11	2
MARKETING/SALES	3	3	–	–	–	–	1	–	–	7	1
MODELING/FORE-CASTING	1	1	1	–	1	–	–	–	1	5	1
COMMUNICATIONS	1	1	–	–	–	1	–	–	1	4	1
GRAPHICS	–	–	–	–	–	–	–	–	1	1	–
SCIENTIFIC/ENGINEER-ING	–	–	–	–	–	–	–	–	–	–	–
DATA BASE	3	2	–	1	1	1	4	4	4	20	4
WORD PROCESSING	–	–	–	–	–	–	–	–	–	–	–
PERFORMANCE MEASUREMENT	–	–	–	–	–	–	–	–	1	1	–
OTHER INDUSTRY SPECIFIC	42	30	4	11	1	9	49	39	39	224	47
TOTAL	109	96	13	24	22	21	62	52	79	478	–
PERCENT	23%	20	3	5	5	4	13	11	17	–	100%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-6

RESPONDENTS LOOKING FOR APPLICATIONS SOFTWARE

INDUSTRY SECTOR	NUMBER OF RESPONSES	PERCENT OF RESPONSES	
		YES	NO/ NO ANSWER
DISCRETE MANUFACTURING	122	52%	48%
PROCESS MANUFACTURING	101	58	42
TRANSPORTATION	14	50	50
UTILITIES	26	46	54
WHOLESALE	22	32	68
RETAIL	21	52	48
BANKING AND FINANCE	53	55	45
INSURANCE	69	43	57
EDUCATION	42	40	60
SERVICES	19	47	53
OTHER	21	48	52
TOTAL/AVERAGE	510	48%	52%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-7
MOST POPULAR METHODS FOR IMPROVING TIME AND COST OF APPLICATION DEVELOPMENT

INDUSTRY SECTOR	PERCENTAGE OF RESPONDENTS BY INDUSTRY SECTOR*					
	ON-LINE PROGRAM-MING	PURCHASED SOFTWARE PRODUCTS	STRUC-TURED PROGRAM-MING METHODS	PROJECT MANAGE-MENT AND CONTROL SYSTEMS	IMPROVED TRAINING OF PERSONNEL	ALL OTHERS
DISCRETE MANUFACTURING	31%	22%	16%	6%	5%	63%
PROCESS MANUFACTURING	40	25	10	–	10	49
TRANSPORTATION	27	46	9	–	18	64
UTILITIES	46	36	18	–	5	45
WHOLESALE	52	32	21	–	5	37
RETAIL	56	13	31	–	6	38
BANKING AND FINANCE	31	29	13	4	9	49
INSURANCE	37	24	15	7	11	47
EDUCATION	16	31	16	9	6	53
SERVICE	25	31	13	13	6	63
OTHER	57	21	7	–	–	43
AVERAGE	38%	28%	15%	4%	7%	50%

SOURCE: INPUT EDP USER PANEL, 1979
*ROW PERCENTAGES TOTAL MORE THAN 100% BECAUSE SOME REPSONDENTS CITED MORE THAN ONE METHOD.
FOR PERCENTAGES BASED ON TOTAL NUMBER OF MENTIONS, SEE THE INDIVIDUAL INDUSTRY CHAPTERS.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-8

MOST SIGNIFICANT EDP PROBLEMS IN 1979

INDUSTRY SECTOR	PERSONNEL AVAILA-BILITY AND PRODUC-TIVITY	NEED FOR OPERATIONS IMPROVE-MENT (INCL. HARDWARE UPGRADE)	IN-ADEQUATE SOFTWARE AND SYSTEMS	LACK OF USER IN-VOLVEMENT IN SYSTEM/ APPLICA-TION DEVEL-OPMENT	LACK OF EFFECTIVE LONG RANGE EDP PLANS	LACK OF MANAGE-MENT IN-VOLVEMENT OR UNDER-STANDING	OTHER	TOTAL NUMBER OF MENTIONS	PERCENT OF MENTIONS
DISCRETE MANUFACTURING	30	12	12	14	15	12	14	109	23%
PROCESS MANUFACTURING	17	11	13	11	12	12	18	94	20
TRANSPORTATION	3	2	2	1	–	1	4	13	3
UTILITIES	6	2	3	4	3	1	4	23	5
WHOLESALE	5	4	3	3	3	1	2	21	4
RETAIL	5	2	2	1	1	2	9	22	5
BANKING AND FINANCE	22	2	5	6	6	3	8	52	11
INSURANCE	20	6	10	12	5	3	8	64	13
SERVICES, EDUCATION AND OTHER	26	10	10	6	10	6	14	82	17
TOTAL	134	51	60	58	55	41	81	480	–
PERCENT	28%	11%	13%	12%	11%	9%	17%	–	100%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- There is a lack of industry and functional area specialists that understand data processing. This shortage of personnel hampers new application development.

- A growing shortage of personnel and shortfalls larger than 25% are already being experienced in some parts of the country. Turnover rates of 30% are not unusual.

- The keys to solving the personnel problems are to:

  . Develop a recruiting, hiring, and training program that will attract recent college graduates and other desired candidates.

  . Provide a path for advancement for all personnel.

- Inadequate software and systems was recognized as being a problem.

  - Software must become more reliable and easier to develop and support if growth rates are to be maintained.

  - New software will be produced by high level, non-procedural languages.

  - Two reports in INPUT's Planning Service For Computer And Communications Users have addressed software issues this year:

    . "Performance Improvement: User Techniques and Experiences," February 1979.

    . "Software Directions: Languages, Development Aids, DBMS, and DDP," July 1979.

- Lack of user involvement was recognized for its importance in effecting the growth of in-house EDP programs.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Users will be encouraged to join EDP steering committees. To increase their familiarity with data processing, users should be invited to participate in educational programs with EDP personnel.

- By the same token EDP staff will be assigned to user areas in order to gain a greater understanding of typical user problems.

- Inadequate planning was mentioned frequently by respondents as being a problem.

  - A detailed long-range plan is essential to obtain the best possible return on the dollars invested in EDP. A blueprint needs to be drawn up which ties in EDP goals with corporate objectives. Tangible benefits accruing from such a move are reduced costs, defensible budgets, and closer working relationships with end users.

  - INPUT's May 1978 report on "Planning: A Methodology for Protecting Your EDP Investment" addresses this issue.

- Respondents use of EDP resources is presented in Exhibit B-9.

  - Overall, programming personnel are slightly more involved in new application development than on existing program maintenance. However, the two areas are very close in personnel use.

  - The retail industry stands out as the only example where substantially more people are working on program development than on maintenance. This reflects the increase in EDP use by retailers.

  - The banking and finance and insurance industries stand out as having the majority of personnel resources tied to program maintenance rather than development. This reflects the maturity of these two industries with respect to EDP usage - software is generally purchased by both industries when available.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-9

EDP RESOURCE UTILIZATION

INDUSTRY SECTOR	PERCENT OF USE				
	COMPUTER EQUIPMENT			PROGRAMMING PERSONNEL	
	PRODUCTION JOBS	NEW APPLICATION DEVELOPMENT	EXISTING PROGRAM MAINTENANCE	NEW PROGRAM DEVELOPMENT	EXISTING PROGRAM MAINTENANCE
DISCRETE MANUFACTURING	69%	14%	11%	56%	41%
PROCESS MANUFACTURING	67	16	14	51	43
TRANSPORTATION	62	18	11	48	46
UTILITIES	65	18	13	46	53
WHOLESALE	75	13	10	51	41
RETAIL	69	21	9	64	29
BANKING AND FINANCE	69	13	14	39	51
INSURANCE	64	15	14	42	51
SERVICES & OTHER	55	18	12	48	46
AVERAGE	66%	16%	12%	49%	45%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The composition of EDP budgets of respondents is shown in Exhibit B-10.

  - Small computers and programmable terminals show a budget growth rate of 45%, reflecting the demand for on-line applications and plans to implement distributed data processing.

  - Communications and on-line systems costs are expected to consume an increasing percentage of the EDP budget in the next three years. The expected budget growth rate in communications expenditures is 35% between 1979 and 1981.

  - EDP managers expect that outside processing services will become a smaller part of the budget in the next three years.

    . EDP managers would like to control outside processing services and minimize their use, but other INPUT studies have shown the processing services usage increases in volume each year.

    . It is extremely unlikely that the EDP manager's objective of decreasing the EDP budget 39% for outside processing services expenditures between 1979 and 1981 will happen.

- EDP managers are not the only buyers of outside computer services. INPUT asked EDP managers to estimate the amount of computer services purchased outside of the EDP department and the results are shown in Exhibit B-11. EDP managers are not aware of all outside computer service expenditures, so that the estimate is very conservative.

  - EDP managers were aware of outside computer services purchases amounting to 50% of what EDP managers spent on outside services.

  - Finance and research and development departments were the largest purchasers, accounting for 45% of the total outside services expenditures known to the EDP manager.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-10

ANTICIPATED CHANGES IN EDP BUDGETS FOR RESPONDENTS IN ALL INDUSTRIES

BUDGET CATEGORY	PERCENT OF TOTAL EDP BUDGET			INCREASE (DECREASE) 1979-1981
	1979	1980	1981	
PERSONNEL	46.9%	47.4%	48.8%	4%
MAINFRAME COMPUTERS AND RELATED DEVICES	28.9	27.6	25.6	(11)
SMALL COMPUTERS/ PROGRAMMABLE TERMINALS	2.4	3.1	3.5	45
NON-PROGRAMMABLE TERMINALS	2.3	2.4	2.5	9
COMMUNICATIONS	3.1	3.7	4.2	35
SOFTWARE (PURCHASE/LEASE)	3.7	4.3	4.8	29
PROCESSING SERVICES (OUTSIDE)	1.8	1.6	1.1	(39)
OTHER	10.5	9.6	9.3	(11)

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-11

OUTSIDE SERVICES PURCHASED BY NON-EDP DEPARTMENTS IN 1978

INDUSTRY GROUP	PERCENT OF AFFIRM-ATIVE RESPON-SES	AVERAGE PURCHASE ($000)	PERCENT BY FINANCE	PERCENT BY R & D	PERCENT BY CORP.	PERCENT BY MFG./ OPER.	PERCENT BY PERS.	PERCENT BY MKTG.	PERCENT CHANGE-INCREASE (DECREASE) 1978-1979	1979-1980
DISCRETE MANUFACTURING	36%	$ 64.8	19%	46%	11%	10%	*	11%	5	(11)
PROCESS MANUFACTURING	42	57.9	21	26	7	17	4	13	5	(3)
TRANSPORTATION	36	181.6	27	2	13	20	-	18	14	(53)
UTILITIES	58	206.1	21	37	7	8	-	8	31	10
WHOLESALE	27	34.0	42	5	-	17	20	-	(*)	(*)
RETAIL	48	210.9	22	8	10	23	10	17	(*)	(12)
BANKING AND FINANCE	42	126.1	31	10	16	13	15	5	7	(7)
INSURANCE	33	43.2	17	2	17	4	10	23	10	(20)
EDUCATION	36	14.9	7	19	7	*	-	-	11	5
SERVICES AND OTHER	23	53.2	41	-	20	22	-	18	23	(9)
AVERAGE, ALL SECTORS	37%	$ 95.2	22%	23%	12%	12%	5%	11%	10%	(8%)

SOURCE: INPUT EDP USER PANEL, 1979
*LESS THAN 1%

- Exhibit B-12 provides the EDP managers' forecast changes in expenditures for outside services and software.

  - EDP managers are forecasting a 20% increase in the use of outside services between 1979 and 1980.

  - Given this rate of growth, it is unlikely that services, as a percent of the EDP budget, will decline to the extent predicted by EDP managers (see Exhibit B-10).

  - This growth rate does not include any change in expenditures made by end users not under the control of the EDP department. INPUT has found that end users generally purchase more services than the EDP manager and are buying more each year.

- Exhibits B-13 through B-15 show selected respondent budget related data.

  - Although the average respondent company has less than 2 EDP employees per 100 total employees, both the banking and finance and insurance industries have over 5 EDP employees per 100 total employees. These two industries make much greater user of EDP than other industries.

  - The retail industry has less than one EDP employee per 100 total employees. EDP is not used to a very great extent in this industry now, but the outlook is changing as large retailers are planning for and implementing point-of-sale, inventory, and other applications.

- The typical respondent company spent over $33,000 per EDP employee per year, as shown in Exhibit B-14. However, the amount spent varies widely with company size and industry sector.

- This data supports the point that larger companies are better targets for outside computer serices than smaller companies.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-12

EDP MANAGERS' ESTIMATES OF
AVERAGE EXPENDITURES FOR SERVICES AND SOFTWARE
FOR ALL INDUSTRIES

TYPE OF SERVICE	1979 AVERAGE EXPENDITURES ($000)	1980 AVERAGE EXPENDITURES ($000)	PERCENT CHANGE 1979-1980 (INCREASE/ DECREASE)
PROCESSING SERVICES			
INTERACTIVE	$ 23.9	$ 29.6	24%
REMOTE BATCH	6.2	9.7	56
BATCH	4.1	3.6	(12)
INPUT/OUTPUT	10.3	10.7	4
SOFTWARE PRODUCTS			
SYSTEMS SOFTWARE	23.8	30.9	30
APPLICATIONS SOFTWARE	20.0	27.4	37
PROFESSIONAL SERVICES			
CONTRACT PROGRAMMING	28.5	33.3	17
EDP CONSULTING	7.5	8.2	9
EDUCATION	7.6	8.7	14
OTHER	2.5	2.3	(8)
FACILITIES MANAGEMENT	6.4	9.5	48
MAINTENANCE			
HARDWARE	45.2	50.6	11
SOFTWARE	4.1	4.7	14
TOTAL	$190.1	$229.2	20%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-13

NUMBER OF EDP EMPLOYEES
PER 100 COMPANY EMPLOYEES
AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	COMPANY SIZE ANNUAL SALES OR ASSETS			
	$100 MILLION OR LESS	$101-999 MILLION	$ 1 BILLION OR MORE	OVERALL
DISCRETE MANUFACTURING	3.4	1.6	0.9	1.5
PROCESS MANUFACTURING	1.7	1.3	1.2	1.3
TRANSPORTATION	1.7	1.8	2.4	2.1
UTILITIES	2.3	2.2	1.6	1.9
WHOLESALE	3.0	1.5	2.3	1.8
RETAIL	2.2	0.7	0.9	0.9
BANKING AND FINANCE	3.5	4.6	6.1	5.3
INSURANCE	9.2	4.1	5.7	5.4
SERVICES AND OTHER	4.2	1.9	2.5	2.9
AVERAGE	3.4	1.6	1.4	1.7

SOURCE: INPUT EDP USER PANEL, 1979

©1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-14

EDP BUDGET DOLLARS PER EDP EMPLOYEE AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	COMPANY SIZE ANNUAL SALES OR ASSETS			
	$100 MILLION OR LESS ($000/EMPLOYEE)	$101-999 MILLION ($000/EMPLOYEE)	$1 BILLION OR MORE ($000/EMPLOYEE)	OVERALL ($000/EMPLOYEE)
DISCRETE MANUFACTURING	$26.3	$30.5	$43.1	$32.2
PROCESS MANUFACTURING	31.8	31.6	39.0	36.1
TRANSPORTATION	64.8	57.6	39.6	47.9
UTILITIES	48.3	38.8	40.3	40.0
WHOLESALE	30.8	24.3	32.0	27.8
RETAIL	22.5	34.1	37.5	34.2
BANKING AND FINANCE	28.6	33.3	28.4	30.6
INSURANCE	32.1	41.1	31.7	36.5
SERVICES AND OTHER	25.9	18.0	13.0	19.8
AVERAGE	$28.9	$32.3	$35.6	$33.1

SOURCE: INPUT EDP USER PANEL, 1979

©1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-15

AVERAGE EDP BUDGET AS REPORTED BY RESPONDENTS

INDUSTRY SECTOR	COMPANY SIZE ANNUAL SALES OR ASSETS			
	$100 MILLION OR LESS ($ MILLION)	$101-999 MILLION ($ MILLION)	$ 1 BILLION OR MORE ($ MILLION)	OVERALL ($ MILLION)
DISCRETE MANUFACTURING	$1.0	$2.9	$15.3	$2.8
PROCESS MANUFACTURING	0.7	1.8	18.6	3.5
TRANSPORTATION	1.8	4.2	33.3	5.8
UTILITIES	1.4	2.6	7.1	3.2
WHOLESALE	0.4	0.9	6.4	1.0
RETAIL	1.2	1.5	8.4	2.5
BANKING AND FINANCE	0.4	1.1	2.9	1.5
INSURANCE	0.9	3.0	8.2	1.9
SERVICES AND OTHER	1.5	2.2	5.7	2.0
AVERAGE	$1.0	$2.2	$10.5	$2.6

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Larger companies have the resources to use outside computer services without seriously impacting their overall budget. These services can be used in parallel with in-house efforts, if necessary, to prove the viability of the outside service before a lasting commitment is made to use the outside service.

- Smaller companies don't have the resources to experiment with outside computer services. The decision to use an outside service becomes an important high level decision with little or no margin for error.

C. USE OF HARDWARE BY EDP MANAGERS

- The growth rates in the installation of minicomputers and microcomputers are shown by industry sector in Exhibit B-16.

  - Minicomputers are increasing in significance as companies add to their established base.

  - The wholesale and retail sectors are investing heavily in minicomputers for specialized applications.

  - Turnkey systems are contributing to the growth in minicomputers. The turnkey solution is appealing to the end user. He is able to buy developed software that is fully supported.

  - Microcomputers will obviously contribute to this growth as they demonstrate that they have minicomputer capability at one-fourth the hardware cost.

  - Growth rates are not generally as large across industry sectors for microcomputers as they are for minicomputers.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-16

MINICOMPUTER AND MICROCOMPUTER INSTALLATIONS BY RESPONDENTS*

INDUSTRY SECTOR	MINICOMPUTERS/SMALL BUSINESS COMPUTERS						MICROCOMPUTERS					
	NONE, NO PLANS	NONE PLANNED	1-10	11-100	100+	1979-1980 GROWTH (PERCENT)	NONE, NO PLANS	NONE PLANNED	1-10	11-100	100+	1979-1980 GROWTH (PERCENT)
DISCRETE MANUFACTURING	25	12	64	7	0	20%	50	7	9	3	–	3%
PROCESS MANUFACTURING	18	8	52	9	2	30	43	1	16	–	–	5
TRANSPORTATION	1	1	8	–	1	6	5	–	2	–	–	3
UTILITIES	4	2	14	–	–	35	13	–	3	1	–	1
WHOLESALE	4	3	9	–	–	77	7	–	3	–	–	5
RETAIL	2	2	14	1	–	75	9	–	3	1	–	–
BANKING AND FINANCE	14	6	24	1	–	9	24	–	3	1	–	2
INSURANCE	28	9	25	2	–	30	43	5	4	–	–	–
EDUCATION AND MEDICAL	5	5	22	6	1	12	7	2	17	7	1	50
SERVICE AND OTHER	3	–	11	6	–	27	9	1	2	1	–	8
TOTAL	104	48	243	32	4	26%	210	16	62	14	1	6%
PERCENT	24%	11	57	7	1	–	69	5	21	5%	–	–

* TOTALS GREATER THAN INDIVIDUAL EXHIBITS SEPARATED BY REVENUE BECAUSE SOME COMPANIES FAILED TO LIST REVENUE DATA
SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Some respondents in the transportation industry indicated a substantial increase in microcomputer installations, particularly in the airlines and larger companies. In INPUT's opinion, this is not representative of the general trend which is placed more realisticaly at 6%. Users tend to hold back from major microcomputer commitments until business software is developed.

D. EDP MANAGERS' CURRENT AND ANTICIPATED INVOLVEMENT IN OFFICE AUTOMATION

- Respondents were asked to state their degree of involvement in automated office services; i.e., electronic mail, word processing, facsimile transmission, and data and voice communications.

  - Electronic mail was not used widely, as is shown in Exhibit B-17. It is generally used only for intracompany purposes. The transportation and retail sectors have the greatest involvement with usage rates of 21% and 24% respectively.

  - Word processing has been adopted by respondents across all sectors. The lowest penetration is in wholesale distribution.

  - Facsimile is gaining in acceptance and usage.

  - Respondents indicated their responsibility may not include automated office services. At the moment, the end user is controlling office services. INPUT anticipates that this will produce difficulties when a company decides to integrate departmental use of automated office services. INPUT's report, "Office of the Future," December 1979, expands on this point.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX B-17

PERCENT OF RESPONDENTS CURRENTLY USING SYSTEMS AND PROGRAMS RELATED TO THE OFFICE OF THE FUTURE

INDUSTRY SECTOR	ELEC-TRONIC MAIL	WORD PRO-CESSING	FACSIMILE	DATA COMMUNI-CATIONS	VOICE COMMUNI-CATIONS	CRT GRAPHICS
DISCRETE MANUFACTURING	7%	44%	71%	79%	77%	24%
PROCESS MANUFACTURING	7	44	69	82	85	22
TRANSPORTATION	21	64	64	71	86	50
UTILITIES	8	77	73	81	77	42
WHOLESALE	–	36	36	82	73	27
RETAIL	24	57	62	86	86	10
BANKING AND FINANCE	6	57	45	76	69	18
INSURANCE	1	70	30	53	50	9
EDUCATION	7	71	14	81	55	60
SERVICES AND OTHER	14	70	53	77	70	23
OVERALL	10%	59%	52%	77%	73%	29%

SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Graphics usage is low in almost all industries. However, this area has extremely high potential. The use of graphics can provide output in easy to understand formats, rather than tabular data typically found on most computer printouts. Several major vendors, such as United Computing Systems and McAUTO, have targeted the graphics area as a major growth opportunity.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C: RECONCILIATION OF MARKET FORECAST DIFFERENCES, 1978/1979

APPENDIX C: RECONCILIATION OF MARKET FORECAST DIFFERENCES, 1978/1979

A. OVERALL MARKET

- The total computer services industry growth rate is forecast at 19% which is 3% greater than the forecast given in the 1978 report. This section of the report explains the differences between the forecasts.

- As can be seen from Exhibit C-1, the size of the 1978 market has been enlarged by $500 million. Two elements account for 95% of the market increase.

  - The insurance industry sector revenues were increased $302 million in 1978. The insurance industry analysis in this Appendix will explain the changes in more detail.

  - The systems software products market was studied which leads to a $253 million increase in 1978 revenues for this mode of delivery. The growth rate was increased from 20% to 33% as a result of this study.

    . Individual increases by industry are shown in the following industry reconciliations.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-1

RECONCILIATION OF COMPUTER SERVICES FORECASTS BY INDUSTRY SECTOR BETWEEN 1978 AND 1979 ANNUAL REPORTS

INDUSTRY SECTOR	1978 FORECAST OF 1978 MARKET ($M)	1979 REPORT OF 1978 MARKET ($M)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($M)	1979 FORECAST OF 1984 MARKET ($M)	AAGR FORECAST IN 1978 REPORT (%)	AAGR FORECAST IN 1979 REPORT (%)
DISCRETE MANUFACTURING	$1,047	$1,123	$ 2,467	$ 3,595	15%	22%
PROCESS MANUFACTURING	597	635	1,366	2,222	15	24
TRANSPORTATION	200	208	486	742	16	24
UTILITIES	325	336	678	913	13	18
BANKING AND FINANCE	1,638	1,644	3,950	3,969	16	16
INSURANCE	558	860	1,267	1,877	15	14
MEDICAL	489	495	1,184	1,245	16	17
EDUCATION	151	163	325	393	14	15
RETAIL	527	535	1,276	1,649	16	21
WHOLESALE	493	497	1,060	1,429	14	20
FEDERAL GOVERNMENT	1,015	1,078	2,609	3,132	17	20
STATE AND LOCAL GOVERNMENT	305	325	772	880	17	18
SERVICES	388	420	928	1,082	16	17
OTHER	375	378	857	1,066	15	20
TOTAL	$8,108	$8,697	$19,225	$24,194	16%	19%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The biggest factor leading to the change in market size and growth rate is the involvement in systems software by hardware manufacturers. Hardware manufacturers control almost one-half of this market and their growth rate in systems software revenue is close to 40%.

- Further information on this subject can be found in the August 1979 INPUT study, "Opportunities in Marketing Systems Software Products."

B. DISCRETE MANUFACTURING

- The growth rate of general business, remote computing services was lowered to reflect two industry trends:
  - Turnkey systems have been sold to this market and are directly competitive with remote computer services.
  - Batch services offer the best price/performance of any mode of delivery. Small manufacturing companies will continue to use this mode of delivery during the forecast period.

- Scientific and engineering processing will be performed through remote computing and batch services to a much greater extent than facilities management. The total size of the scientific and engineering market in this industry remains unchanged, as shown in Exhibit C-2.

- Batch services provided to the discrete manufacturing industry have not weakened as projected in 1978. Several recent surveys are projecting double digit growth for certain segments of this market. A new forecast for batch services was developed using the recent survey data.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-2

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN DISCRETE MANUFACTURING BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 45	$ 45	$ 175	$ 134	25%	20%
	SCI. & ENG	50	50	150	150	20	20
	IND. SPEC.	135	135	424	424	21	21
	UTILITY	70	70	181	190	17	18
SUBTOTAL		300	300	930	898	21	20
FACILITIES MANAGEMENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	5	5	26	12	32	19
	IND. SPEC.	26	26	78	78	20	20
	UTILITY	20	20	53	53	18	17
SUBTOTAL		51	51	157	143	21	19
BATCH	GEN. BUS.	170	170	208	368	4	14
	SCI. & ENG.	21	21	8	21	(16)	0
	IND. SPEC.	60	60	105	100	10	8
	UTILITY	50	50	38	60	(5)	3
SUBTOTAL		301	301	359	549	4	10
TOTAL PROCESSING	GEN. BUS.	215	215	383	502	10	15
	SCI. & ENG.	76	76	184	183	15	16
	IND. SPEC.	221	221	607	602	18	18
	UTILITY	140	140	272	303	11	14
TOTAL		$ 652	$ 652	$ 1,446	$ 1,590	14%	16%
SOFTWARE PRODUCTS	SYSTEM	$ 95	$ 171	$ 341	$ 935	24%	33%
	APPLICATION	90	90	329	425	24	29
TOTAL		$ 185	$ 261	$ 670	$ 1,360	24%	31%
PROFESSIONAL SERVICES		210	210	400	645	11	21
GRAND TOTAL		$ 1,047	$ 1,123	$ 2,516	$ 3,595	15%	22%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Batch general business services will remain extremely cost competitive through 1984. Many manufacturing firms, especially small companies, will continue to use these services extensively.

- Industry specialty applications will be mainly processed through remote computing services, facilities management, and turnkey systems, thereby weakening the market for batch services.

- The growth rate in applications software has been raised to reflect the success by vendors in selling MRP, N/C, and CAD/CAM. The recent successes in these and other areas are expected to continue for the forecast period.

- The professional services growth rate was raised, based on a survey of expenditures by users. According to a recent INPUT survey, users spent 35% more for contract programming in 1979 than in 1978. Expenditures will remain high as firms contract out for software when they don't have capacity or expertise to produce internally.

C. PROCESS MANUFACTURING

- Batch processing of all types of service will be greater in the next five years than was originally envisioned, as shown in Exhibit C-3.

  - Small companies will lead the way in the use of batch services.

- A recent user software products buyer study conducted by INPUT found that process manufacturing EDP managers purchased 43% more applications software in 1979 than in 1978. INPUT expects that a high growth rate for application software products will exist throughout the forecast period.

- Large oil companies have needed, and will continue to need, special production cost data to justify prices. Special software is generally required to produce

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-3

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN PROCESS MANUFACTURING BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 35	$ 35	$ 103	$ 104	20%	20%
	SCI. & ENG	30	30	86	86	19	20
	IND. SPEC.	82	82	268	268	22	22
	UTILITY	79	79	196	197	16	16
SUBTOTAL		226	226	653	655	19	20
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	2	2	3	4	8	15
	IND. SPEC.	27	27	70	70	17	17
	UTILITY	5	5	14	12	19	19
SUBTOTAL		34	34	87	86	17	17
BATCH	GEN. BUS.	52	52	62	86	4	9
	SCI. & ENG.	13	13	9	14	(5)	0
	IND. SPEC.	27	27	41	50	7	11
	UTILITY	35	35	27	43	(5)	3
SUBTOTAL		127	127	139	193	2	7
TOTAL PRO-CESSING	GEN. BUS.	87	87	165	190	11	14
	SCI. & ENG.	45	45	98	104	14	16
	IND. SPEC.	136	136	379	388	19	19
	UTILITY	119	119	237	252	12	13
TOTAL		$ 387	$ 387	$ 879	$ 934	14%	16%
SOFTWARE PRODUCTS	SYSTEM	$ 65	$ 103	$ 164	$ 720	17%	38%
	APPLICA-TION	30	30	113	185	25	37
TOTAL		$ 95	$ 133	$ 277	$ 905	19%	38%
PROFESSIONAL SERVICES		115	115	224	383	12	23
GRAND TOTAL		$ 597	$ 635	$ 1,380	$ 2,222	15%	24%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

that data in the proper format required by the federal government. This need for special software is a major driving force for increasing the use of professional services.

- Oil companies' EDP staff don't have enough personnel to generate all of the software required by its users.

- Oil companies are typically more concerned with maintaining control of head count rather than costs so that professional services usage appeals to this market segment.

D. TRANSPORTATION

- General business services will be provided equally between remote computing and batch, as Exhibit C-4 shows. Batch services remain important to small companies where no decrease in use has yet been detected.

- Applications software opportunities appear to be much stronger in 1979 than a year ago. Industry subsectors, such as motor freight, have received a great deal of computer service attention and this trend is expected to continue for the next five years.

- User expenditures for contract programming increased over 80% between 1978 and 1979, as reported in a recent INPUT survey. Although the industry is not expected to sustain this level of growth, the rate will be closer to 30% per year rather than 9% as forecast last year.

E. UTILITIES

- Turnkey systems have been sold to utility companies by vendors such as Westinghouse and Zytron. The success of systems such as these have caused

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-4

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN TRANSPORTATION BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 9	$ 9	$ 38	$ 28	27%	21%
	SCI. & ENG	3	3	6	5	11	11
	IND. SPEC.	40	40	158	151	26	25
	UTILITY	22	22	52	52	15	14
SUBTOTAL		74	74	254	236	23	21
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	25	25	51	50	13	11
	UTILITY	–	–	–	–	–	–
SUBTOTAL		25	25	51	50	13	11
BATCH	GEN. BUS.	16	16	17	28	1	9
	SCI. & ENG.	2	2	0	2	0	0
	IND. SPEC.	16	16	31	30	12	11
	UTILITY	7	7	5	7	7	0
SUBTOTAL		41	41	53	67	5	8
TOTAL PRO-CESSING	GEN. BUS.	25	25	55	56	14	14
	SCI. & ENG	5	5	6	7	–	7
	IND. SPEC.	81	81	240	231	20	19
	UTILITY	29	29	57	59	12	12
TOTAL		$ 140	$ 140	$ 358	$ 353	16%	16%
SOFTWARE PRODUCTS	SYSTEM	$ 17	$ 25	$ 41	$ 183	16%	40%
	APPLICA-TION	15	15	49	91	22	35
TOTAL		$ 32	$ 40	$ 90	$ 274	19%	38%
PROFESSIONAL SERVICES		28	28	48	115	9	28
GRAND TOTAL		$ 200	$ 208	$ 496	$ 742	16%	24%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

INPUT to revise its forecast downward for remote computing services, as shown in Exhibit C-5.

- There is no evidence of the reduced batch services usage by smaller firms that was anticipated last year. As s result, the forecast for batch services has been revised to reflect that batch activity will remain essentially unchanged during the next five years.

- EDP user panel respondents indicated a fourfold increase in applications software purchases in 1979 over 1978. The growth rate for applications software was revised upward to reflect the acceptability by users of the software available in the market.

- Professional services expenditures in this industry increased 18% between 1979 and 1978. No slow down in expenditures is expected during the forecast period.

F. BANKING AND FINANCE

- INPUT conducted a detailed survey on the banking and finance industry sector in 1979. Although the overall expenditure level and growth rate remained essentially unchanged, there were major changes in the categories of expenditures, as shown in Exhibit C-6.

  - Utility services were found to be used to a much smaller extent than originally forecast. Banks do almost all of this type of processing in-house.

  - General business applications were increased nearly $170 million, reflecting the heavy use made by banks of payroll and other accounting services.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-5

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN UTILITIES BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 10	$ 10	$ 36	$ 32	24%	22%
	SCI. & ENG	45	45	90	98	12	14
	IND. SPEC.	42	42	194	151	29	23
	UTILITY	75	75	132	142	10	11
SUBTOTAL		172	172	452	423	17	16
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	2	2	3	2	6	0
	IND. SPEC.	–	–	–	–	–	–
	UTILITY	5	5	13	13	17	17
SUBTOTAL		7	7	16	15	15	13
BATCH	GEN. BUS.	10	10	5	16	(11)	8
	SCI. & ENG.	18	18	9	18	(12)	0
	IND. SPEC.	8	8	11	12	5	4
	UTILITY	14	14	5	15	(19)	0
SUBTOTAL		50	50	30	61	(9)	2
TOTAL PRO-CESSING	GEN. BUS.	20	20	41	48	12	16
	SCI. & ENG.	65	65	102	118	7	11
	IND. SPEC.	50	50	205	163	26	21
	UTILITY	94	94	150	170	8	10
TOTAL		$ 229	$ 229	$ 498	$ 499	13 %	14 %
SOFTWARE PRODUCTS	SYSTEM	$ 20	$ 31	$ 57	$ 171	19 %	33 %
	APPLICA-TION	10	10	33	65	22	38
TOTAL		$ 30	$ 41	$ 90	$ 236	20 %	35 %
PROFESSIONAL SERVICES		66	66	109	178	9	18
GRAND TOTAL		$ 325	$ 336	$ 697	$ 913	13%	18%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-6

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN BANKING AND FINANCE BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 24	$ 85	$ 96	$ 266	26%	21%
	SCI. & ENG	–	–	–	–	–	–
	IND. SPEC.	540	439	1,670	1,501	21	23
	UTILITY	108	39	267	82	16	13
SUBTOTAL		672	563	2,033	1,849	20	22
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	270	197	935	512	23	17
	UTILITY	–	–	–	–	–	–
SUBTOTAL		270	197	935	512	23	17
BATCH	GEN. BUS.	14	121	21	206	7	9
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	335	432	397	656	3	7
	UTILITY	24	7	19	13	(4)	11
SUBTOTAL		373	560	437	875	3	8
TOTAL PRO-CESSING	GEN. BUS.	38	206	117	472	20	15
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	1,145	1,068	3,002	2,669	17	16
	UTILITY	132	46	286	95	14	13
TOTAL		$ 1,315	$ 1,320	$ 3,405	$ 3,236	17%	16%
SOFTWARE PRODUCTS	SYSTEM	$ 67	$ 55	$ 155	$ 118	15%	14%
	APPLICA-TION	126	161	239	361	11	14
TOTAL		$ 193	$ 216	$ 394	$ 479	13%	14%
PROFESSIONAL SERVICES		130	108	299	254	15	15
GRAND TOTAL		$ 1,638	$ 1,644	$ 4,098	$ 3,969	16%	16%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Industry specialty processing was reduced nearly $80 million, as a result of a user survey. Shifts in modes of delivery were made based on the same survey.

- Expenditures were shifted between the software and professional services categories to more accurately reflect usage, but the overall level remained unchanged.

- Detailed industry subsector forecasts can be found in the July 1979 INPUT report, "Computer Services Markets In Banking And Finance."

G. INSURANCE

- Insurance industry computer services expenditure patterns were closely examined by INPUT in 1979 and forecasts for the expenditures were changed accordingly. Nearly all modes of delivery were found to be conservatively stated as shown in Exhibit C-7.

  - The largest area of increase was in facilities management - nearly $140 million was added to the expenditure level, or 45% of the total increase for the entire industry.

  - The second largest area of increase was in applications software where over $80 million in expenditures were added.

- More detailed information on this industry can be found in the two 1979 Market Analysis Service studies from INPUT:

  - "Computer Services Markets In Insurance Companies," November 1979.

  - "Computer Services Markets In Government Funded Health Insurance," November 1979.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-7

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN INSURANCE BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 14	$ 63	$ 49	$ 164	23%	17%
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	42	62	113	195	18	21
	UTILITY	30	18	71	33	18	11
SUBTOTAL		86	143	233	392	19	18
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	225	362	518	767	15	13
	UTILITY	–	–	–	–	–	–
SUBTOTAL		225	362	518	767	15	13
BATCH	GEN. BUS.	8	20	11	29	5	6
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	63	54	69	85	1	8
	UTILITY	19	9	18	13	(1)	6
SUBTOTAL		90	83	98	127	1	7
TOTAL PRO-CESSING	GEN. BUS.	22	83	60	193	18	15
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	330	478	700	1,047	13	14
	UTILITY	49	27	89	46	12	11
TOTAL		$ 401	$ 588	$ 849	$ 1,286	13%	14%
SOFTWARE PRODUCTS	SYSTEM	$ 45	$ 51	$ 132	$ 118	20%	15%
	APPLICA-TION	30	111	83	254	18	15
TOTAL		$ 75	$ 162	$ 215	$ 372	19%	15%
PROFESSIONAL SERVICES		82	110	197	219	16	12
GRAND TOTAL		$ 558	860	$1,261	$ 1,877	15	14

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

H. MEDICAL

- Relatively minor changes were made to the 1979 market forecast for the medical industry, as can be seen in Exhibit C-8.

- Industry specialty expenditures were shifted and reduced by over $30 million in 1984 to reflect the inroads that will be made by turnkey systems. HBO, SMS, CyCare, and McAUTO are successful turnkey vendors that will be vieing for market dominance during the next five years.

- Applications software expenditues are expected to grow more rapidly than was foreseen in 1978 due to the acceptance of computers in the industry and the proliferation of hardware from turnkey systems.

- Turnkey systems will also negatively impact the professional services market in the next five years. The growth rate for professional services was reduced for this reason.

I. EDUCATION

- Minor changes were made to the education industry forecasts, as shown in Exhibit C-9.

- Software and professional services changes were greatest.

  - The applications software market is not maturing as was thought in 1978.

  - As a result, the professional services market has improved as educational institutions are obtaining custom rather than packaged software solutions.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-8

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN MEDICAL BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 9	$ 9	$ 31	$ 31	23%	23%
	SCI. & ENG	2	2	9	4	29	15
	IND. SPEC.	115	115	422	382	24	23
	UTILITY	6	6	25	17	27	19
SUBTOTAL		132	132	487	434	24	22
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	135	135	325	289	16	13
	UTILITY	–	–	–	–	–	–
SUBTOTAL		135	135	325	289	16	13
BATCH	GEN. BUS.	17	17	18	23	1	5
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	120	120	133	175	2	6
	UTILITY	6	6	5	7	(4)	0
SUBTOTAL		143	143	156	205	1	6
TOTAL PRO-CESSING	GEN. BUS.	26	26	49	54	11	13
	SCI. & ENG.	2	2	9	4	29	15
	IND. SPEC.	370	370	880	846	15	15
	UTILITY	12	12	30	24	16	11
TOTAL		$ 410	$ 410	$ 968	$ 928	15%	15%
SOFTWARE PRODUCTS	SYSTEM	$ 11	$ 17	$ 52	$ 129	30%	40%
	APPLICA-TION	22	22	88	108	26	32
TOTAL		$ 33	$ 39	$ 140	$ 237	27%	36%
PROFESSIONAL SERVICES		46	46	97	80	13	8
GRAND TOTAL		$ 489	$ 495	$ 1,205	$ 1,245	16%	17%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-9

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN EDUCATION BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 9	$ 9	$ 25	$ 25	19%	18%
	SCI. & ENG	7	7	12	11	9	9
	IND. SPEC.	6	6	24	21	26	21
	UTILITY	16	16	26	25	9	7
SUBTOTAL		38	38	87	82	15	13
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	17	17	49	43	19	17
	UTILITY	–	–	–	–	–	–
SUBTOTAL		17	17	49	43	19	17
BATCH	GEN. BUS.	8	8	17	13	13	8
	SCI. & ENG.	2	2	5	2	15	0
	IND. SPEC.	17	17	32	29	11	9
	UTILITY	8	8	4	9	(10)	0
SUBTOTAL		35	35	58	53	9	6
TOTAL PRO-CESSING	GEN. BUS.	17	17	42	38	16	14
	SCI. & ENG.	9	9	17	13	11	8
	IND. SPEC.	40	40	105	93	17	15
	UTILITY	24	24	30	34	3	5
TOTAL		$ 90	$ 90	$ 194	$ 178	13%	12%
SOFTWARE PRODUCTS	SYSTEM	$ 16	$ 28	$ 57	$ 107	23%	25%
	APPLICA-TION	9	9	37	24	26	17
TOTAL		$ 25	$ 37	$ 94	$ 131	25%	23%
PROFESSIONAL SERVICES		36	36	42	84	2	14
GRAND TOTAL		$151	$163	$330	$393	14%	15%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

J. RETAIL

- Industry specialty processing provided by remote computing is significantly increased in this year's forecast to reflect the successes that vendors have experienced in 1979 and their expected success through 1984. Retailers have begun to see the merit of interactive computing earlier than INPUT initially projected.

- Applications software and professional services are expected to follow the trend toward interactive computing and will, therefore, experience growth rates higher than those forecast in 1978.

- General business batch processing will remain extremely cost effective throughout the forecast period. Very small retailers will initially reject turnkey systems and remote computing services in favor of batch processing. Although this trend will change, its impact will not be felt during the forecast period. The batch market, as Exhibit C-10 shows, is attractive through 1984.

K. WHOLESALE

- The only major change to the wholesale industry forecast made in 1979 for computer processing was in batch services. As Exhibit C-11 shows, batch services have been reforecast in 1979 to grow at 15% a year for the next five years.

  - Small wholesalers that can't cost justify their own computer or a remote computing service will still want to obtain the advantages that computerization can provide. These companies will use batch processing because of its price/performance characteristics.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-10

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN RETAIL BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 20	$ 20	$ 81	$ 63	26%	25%
	SCI. & ENG	–	–	–	–	–	–
	IND. SPEC.	225	225	643	705	19	21
	UTILITY	25	25	71	72	19	19
SUBTOTAL		270	270	795	840	20	21
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	5	5	19	14	24	18
	UTILITY	–	–	–	–	–	–
SUBTOTAL		5	5	19	14	24	18
BATCH	GEN. BUS.	65	65	59	138	(2)	15
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	70	70	78	79	2	1
	UTILITY	25	25	25	26	0	0
SUBTOTAL		160	160	162	243	0	7
TOTAL PRO-CESSING	GEN. BUS.	85	85	140	201	8	16
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	300	300	740	798	16	18
	UTILITY	50	50	96	98	11	12
TOTAL		$ 435	$ 435	$ 976	$ 1,097	14%	17%
SOFTWARE PRODUCTS	SYSTEM	$ 16	$ 24	$ 78	$ 265	30%	50%
	APPLICA-TION	26	26	115	147	28	34
TOTAL		$ 42	$ 50	$ 193	$ 412	29%	43%
PROFESSIONAL SERVICES		50	50	129	140	17	19
GRAND TOTAL		$527	$535	$1,298	$1,649	16%	21%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-11

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN WHOLESALE BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 51	$ 51	$ 154	$ 154	20%	20%
	SCI. & ENG	–	–	–	–	–	–
	IND. SPEC.	74	74	208	224	19	20
	UTILITY	19	19	46	47	16	16
SUBTOTAL		144	144	408	425	19	20
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	29	29	61	61	13	13
	UTILITY	4	4	9	8	15	10
SUBTOTAL		33	33	70	69	13	13
BATCH	GEN. BUS.	107	107	141	229	5	15
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	32	32	37	36	2	1
	UTILITY	78	78	95	95	3	2
SUBTOTAL		217	217	273	360	4	9
TOTAL PRO-CESSING	GEN. BUS.	158	158	295	383	11	17
	SCI.& ENG.	–	–	–	–	–	–
	IND. SPEC.	135	135	306	321	14	15
	UTILITY	101	101	150	150	7	6
TOTAL		$ 394	$ 394	$ 751	$ 854	11%	14%
SOFTWARE PRODUCTS	SYSTEM	$ 12	$ 16	$ 51	$ 220	27%	56%
	APPLICA-TION	45	45	191	241	27	33
TOTAL		$ 57	$ 61	$ 242	$ 461	27%	41%
PROFESSIONAL SERVICES		42	42	84	114	12	18
GRAND TOTAL		$493	$497	$1,077	$1,429	14%	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- There has been substantial turnkey systems activity during the last 12 months in this industry. Turnkey systems successes generally stimulate a market for follow-on applications software and professional services. This factor was important in the decision to raise the growth rates in 1979 for these computer services.

L. FEDERAL GOVERNMENT

- The major change in 1979 to the federal government computer services forecast, shown in Exhibit C-12, is for systems software.

- The market potential for scientific and engineering processing was lowered slightly, based on vendor performance in this industry.

- The growth rate for applications software was lowered based on vendor experiences. The market is relatively poor for applications packages, but healthy for professional services.

  - Professional services grew 20% in 1979 over 1978 and that growth rate is expected to continue through 1984.

M. STATE AND LOCAL GOVERNMENT

- As Exhibit C-13 shows, minor changes were made to the 1978 forecast in 1979.

- State and local governments are buying turnkey systems rather than applications software. This activity has resulted in a reduced growth forecast for applications software through 1984.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-12

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN FEDERAL GOVERNMENT BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 21	$ 21	$ 67	$ 63	21%	21%
	SCI. & ENG	50	50	115	101	15	12
	IND. SPEC.	17	17	48	59	19	23
	UTILITY	164	164	625	615	25	26
SUBTOTAL		252	252	855	838	22	23
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	92	92	146	140	8	7
	IND. SPEC.	–	–	–	–	–	–
	UTILITY	153	153	386	387	17	16
SUBTOTAL		245	245	532	527	14	13
BATCH	GEN. BUS.	–	–	–	5	–	14
	SCI. & ENG.	8	8	4	10	(10)	2
	IND. SPEC.	–	–	–	–	–	–
	UTILITY	45	45	39	48	(2)	0
SUBTOTAL		53	53	43	63	(3)	2
TOTAL PRO-CESSING	GEN. BUS.	21	21	67	68	21	23
	SCI. & ENG.	150	150	265	251	10	9
	IND. SPEC.	17	17	48	59	19	23
	UTILITY	362	362	1,050	1,050	19	20
TOTAL		$ 550	$ 550	$ 1,430	$ 1,428	17%	18%
SOFTWARE PRODUCTS	SYSTEM	$ 100	$ 163	$ 300	$ 623	20%	25%
	APPLICA-TION	15	15	64	38	27	15
TOTAL		$ 115	$ 178	$ 364	$ 661	21%	24%
PROFESSIONAL SERVICES		350	350	841	1,043	16	20
GRAND TOTAL		$1,015	$1,078	$2,635	$3,132	17%	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-13

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN STATE AND LOCAL GOVERNMENT BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 10	$ 10	$ 53	$ 49	32%	32%
	SCI. & ENG	5	5	30	27	35	40
	IND. SPEC.	7	7	44	36	36	35
	UTILITY	24	24	114	105	30	29
SUBTOTAL		46	46	241	217	32	32
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	5	5	26	26	32	34
	UTILITY	19	19	36	33	11	9
SUBTOTAL		24	24	62	59	17	17
BATCH	GEN. BUS.	10	10	16	16	9	8
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	10	10	45	38	29	28
	UTILITY	35	35	30	39	(2)	2
SUBTOTAL		55	55	91	93	8	10
TOTAL PRO-CESSING	GEN. BUS.	20	20	69	65	22	23
	SCI. & ENG.	5	5	30	27	35	40
	IND. SPEC.	22	22	115	100	32	32
	UTILITY	78	78	180	177	14	16
TOTAL		$ 125	$ 125	$ 394	$ 369	20%	22%
SOFTWARE PRODUCTS	SYSTEM	$ 26	$ 46	$ 71	$ 137	18%	20%
	APPLICA-TION	12	12	43	29	24	14
TOTAL		$ 38	$ 58	$ 114	$ 166	20%	19%
PROFESSIONAL SERVICES		142	142	280	345	12	15
GRAND TOTAL		$305	$325	$788	$880	17%	18%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Professional services grew 19% between 1978 and 1979. The long-term growth forecast has been revised upward because of this and other data pointing to the need for new software which state and local governments don't have the resources and expertise to create internally.

N. SERVICES

- The growth rate for general business processing has been lowered because of the inroads that turnkey systems are making in this area. Similarly, growth rates in industry specialty and utility batch processing were lowered because of the success of turnkey systems.

- The size of the batch services market for general business processing was raised nearly $30 million for 1978 after a survey of vendor activity, as shown in Exhibit C-14.

- Follow-on activity from installed turnkey systems has stimulated the market for applications software and for professional services. The forecast growth rates in these areas were raised after this analysis was completed.

O. OTHER

- As Exhibit C-15 shows, the growth rate for general business processing services has been lowered in the 1979 forecast. This action was taken after a review of vendor activity and a study of the impact that turnkey systems was having on the marketplace.

- Applications software and professional services growth rates were raised because:

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-14

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN SERVICES BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 18	$ 18	$ 68	$ 56	25%	21%
	SCI. & ENG.	82	82	170	168	13	13
	IND. SPEC.	56	56	213	214	25	25
	UTILITY	34	34	130	125	25	25
SUBTOTAL		190	190	581	563	20	20
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	–	–	–	–	–	–
	UTILITY	–	–	–	–	–	–
SUBTOTAL		–	–	–	–	–	–
BATCH	GEN. BUS.	6	34	20	90	22	18
	SCI. & ENG.	12	12	10	13	(4)	0
	IND. SPEC.	125	125	233	210	11	8
	UTILITY	15	15	7	18	20	0
SUBTOTAL		158	186	270	331	9	9
TOTAL PRO-CESSING	GEN. BUS.	24	52	88	146	24	19
	SCI. & ENG.	94	94	180	181	11	12
	IND. SPEC.	181	181	446	424	16	14
	UTILITY	49	49	137	143	18	19
TOTAL		$ 348	$ 376	$ 851	$ 894	16%	15%
SOFTWARE PRODUCTS	SYSTEM	$ 8	$ 12	$ 24	$ 69	20%	34%
	APPLICA-TION	21	21	46	89	14	26
TOTAL		$ 29	$ 33	$ 70	$ 158	16%	29%
PROFESSIONAL SERVICES		11	11	23	30	13	18
GRAND TOTAL		$388	$420	$944	$1,082	16%	17%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX C-15

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN OTHER INDUSTRY BETWEEN 1978 AND 1979 ANNUAL REPORTS

COMPUTER SERVICE		1978 FORECAST OF 1978 MARKET ($ MILLION)	1979 REPORT OF 1978 MARKET ($ MILLION)	1978 FORECAST OF 1983 EXTENDED FOR 1984 MARKET ($ MILLION)	1979 FORECAST OF 1984 MARKET ($ MILLION)	AAGR FORECAST IN 1978 REPORT (PERCENT)	AAGR FORECAST IN 1979 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	GEN. BUS.	$ 8	$ 8	$ 23	$ 18	19%	15%
	SCI. & ENG	27	27	82	76	20	20
	IND. SPEC.	22	22	77	75	23	23
	UTILITY	48	48	137	138	19	19
SUBTOTAL		105	105	319	307	20	20
FACILITIES MANAGE-MENT	GEN. BUS.	–	–	–	–	–	–
	SCI. & ENG.	–	–	–	–	–	–
	IND. SPEC.	7	7	12	12	9	11
	UTILITY	4	4	12	12	20	11
SUBTOTAL		11	11	24	24	24	17
BATCH	GEN. BUS.	58	58	127	112	22	14
	SCI. & ENG.	17	17	18	18	1	1
	IND. SPEC.	85	85	164	162	12	14
	UTILITY	13	13	15	16	3	3
SUBTOTAL		173	173	324	308	10	12
TOTAL PRO-CESSING	GEN. BUS.	66	66	150	130	13	14
	SCI. & ENG.	44	44	100	94	14	15
	IND. SPEC.	114	114	253	249	14	16
	UTILITY	65	65	164	166	17	17
TOTAL		$ 289	$ 289	$ 667	$ 639	15%	16%
SOFTWARE PRODUCTS	SYSTEM	$ 10	$ 13	$ 24	$ 150	16%	51%
	APPLICA-TION	22	22	79	104	24	31
TOTAL		$ 32	$ 35	$ 103	$ 254	22%	41%
PROFESSIONAL SERVICES		54	54	101	173	11	22
GRAND TOTAL		$375	$378	$871	$1,066	15%	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- Turnkey systems installations have a follow-on market for applications software and professional services.

- A recent INPUT survey of user expenditures indicated substantially higher growth rates than were projected in 1978.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D: TOTAL PROCESSING SERVICES MARKETS BY MODE OF DELIVERY

APPENDIX D: TOTAL PROCESSING SERVICES MARKETS BY MODE OF DELIVERY

- This appendix provides summary data on processing modes of delivery:
  - Remote computing.
  - Facilities management.
  - Batch.
- The data is also segmented by type of service within processing mode. The types of service are:
  - General business.
  - Scientific and engineering.
  - Industry specialty.
  - Utility.
- Each exhibit contains industry data on all 14 industries INPUT tracks.
- Remote computing services (RCS) forecasts are detailed in Exhibits D-1 through D-5.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-1

REMOTE COMPUTING SERVICES - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 300	$ 357	19%	$ 429	$ 518	$ 623	$ 747	$ 898	20%
PROCESS MANUFACTURING	226	268	19	319	371	457	548	655	20
TRANSPORTATION	74	91	23	111	136	163	197	236	27
UTILITIES	172	202	17	239	270	315	365	423	16
BANKING AND FINANCE	563	689	22	843	1,032	1,253	1,522	1,849	22
INSURANCE	143	169	18	199	236	280	331	392	18
MEDICAL	132	158	20	185	228	279	349	434	22
EDUCATION	38	44	15	51	57	65	73	82	13
RETAIL	270	329	22	398	480	580	698	840	21
WHOLESALE	144	174	21	207	246	298	357	425	20
FEDERAL GOVERNMENT	252	300	19	369	460	565	693	838	23
STATE & LOCAL GOVERNMENT	46	54	17	74	105	139	178	217	32
SERVICES	190	224	18	271	326	394	472	563	20
OTHER	105	124	18	151	179	220	262	307	20
TOTAL	$2,655	$3,183	20%	$3,846	$4,644	$5,631	$6,792	$8,159	21%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-2

REMOTE COMPUTING SERVICES - GENERAL BUSINESS FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 45	$ 54	20%	$ 65	$ 78	$ 93	$ 112	$ 134	20%
PROCESS MANUFACTURING	35	42	20	50	60	72	86	104	20
TRANSPORTATION	9	11	21	14	17	20	24	28	21
UTILITIES	10	12	20	16	20	24	28	32	22
BANKING AND FINANCE	85	105	21	128	155	185	223	266	21
INSURANCE	63	74	17	86	101	119	141	164	17
MEDICAL	9	11	21	13	17	21	26	31	23
EDUCATION	9	11	21	13	15	18	21	25	18
RETAIL	20	27	33	33	40	47	55	63	25
WHOLESALE	51	62	21	73	87	110	129	154	20
FEDERAL GOVERNMENT	21	24	15	29	36	43	53	63	21
STATE & LOCAL GOVERNMENT	10	12	20	17	21	29	39	49	32
SERVICES	18	22	20	28	35	42	49	56	21
OTHER	8	9	15	10	12	14	16	18	15
TOTAL	$ 393	$ 476	21%	$ 575	$ 694	$ 837	$1,002	$1,187	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-3

REMOTE COMPUTING SERVICES - SCIENTIFIC AND ENGINEERING FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 50	$ 60	20%	$ 67	$ 80	$ 100	$ 125	$ 150	20%
PROCESS MANUFACTURING	30	34	15	43	50	60	72	86	20
TRANSPORTATION	3	3	11	3	4	4	5	5	11
UTILITIES	45	51	14	58	66	76	86	98	14
BANKING AND FINANCE *	-	-	-	-	-	-	-	-	-
INSURANCE *	-	-	-	-	-	-	-	-	-
MEDICAL	2	2	15	2	3	3	3	4	15
EDUCATION	7	7	7	8	8	9	10	11	9
RETAIL *	-	-	-	-	-	-	-	-	-
WHOLESALE *	-	-	-	-	-	-	-	-	-
FEDERAL GOVERNMENT	50	58	15	66	74	83	92	101	12
STATE & LOCAL GOVERNMENT	5	5	9	8	12	17	22	27	40
SERVICES	82	91	11	102	114	130	149	168	13
OTHER	27	30	11	37	44	54	65	76	20
TOTAL	$ 301	$ 341	13%	$ 394	$ 455	$ 536	$ 629	$ 726	16%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $4 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-4

REMOTE COMPUTING SERVICES - INDUSTRY SPECIALTY FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 135	$ 161	19%	$ 200	$ 245	$ 295	$ 350	$ 424	21%
PROCESS MANUFACTURING	82	98	20	120	144	180	220	268	22
TRANSPORTATION	40	50	25	62	78	97	121	151	25
UTILITIES	42	53	25	68	76	96	121	151	23
BANKING AND FINANCE	439	540	23	665	821	1,005	$1,228	1,501	23
INSURANCE	62	75	21	91	110	133	160	195	21
MEDICAL	115	138	20	162	198	243	306	382	23
EDUCATION	6	8	25	10	12	15	18	21	21
RETAIL	225	272	21	329	398	482	583	705	21
WHOLESALE	74	90	22	108	128	152	187	224	20
FEDERAL GOVERNMENT	17	21	23	26	32	39	48	59	23
STATE & LOCAL GOVERNMENT	7	8	15	12	18	23	30	36	35
SERVICES	56	70	25	88	109	137	171	214	25
OTHER	22	27	24	34	39	53	64	75	23
TOTAL	$1,322	$1,611	22%	$1,975	$2,408	$2,950	$3,607	$4,406	22%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-5

REMOTE COMPUTING SERVICES - UTILITY FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 70	$ 82	17%	$ 97	$ 115	$ 135	$ 160	$ 190	18%
PROCESS MANUFACTURING	79	94	19	106	117	145	170	197	16
TRANSPORTATION	22	27	22	32	37	42	47	52	14
UTILITIES	75	86	14	97	108	119	130	142	11
BANKING AND FINANCE	39	44	13	50	56	63	71	82	13
INSURANCE	18	20	11	22	25	28	30	33	11
MEDICAL	6	7	20	8	10	12	14	17	19
EDUCATION	16	18	9	20	22	23	24	25	7
RETAIL	25	30	19	36	42	51	60	72	19
WHOLESALE	19	22	18	26	31	36	41	47	16
FEDERAL GOVERNMENT	164	197	20	248	318	400	500	615	26
STATE & LOCAL GOVERNMENT	24	29	21	37	54	70	87	105	29
SERVICES	34	41	21	53	68	85	103	125	25
OTHER	48	58	20	70	84	99	117	138	19
TOTAL	$ 639	$ 755	18%	$ 902	$1,087	$1,308	$1,554	$1,840	20%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

- The total market forecast for RCS is shown in Exhibit D-1.
- General business RCS is forecast in Exhibit D-2.
- Scientific and engineering RCS is forecast in Exhibit D-3.
- Industry specialty RCS is forecast in Exhibit D-4.
- Utility RCS is forecast in Exhibit D-5.

• Facilities management (FM) services forecasts are shown in Exhibits D-6 through D-9.

- The total FM market forecast is shown in Exhibit D-6.
- There is no general business FM.
- Scientific and engineering FM is forecast in Exhibit D-7.
- Industry specialty FM is forecast in Exhibit D-8.
- Utility FM is forecast in Exhibit D-9.

• Batch services are forecast in Exhibits D-10 through D-14.

- The total batch services market forecast is shown in Exhibit D-10.
- General business batch services are forecast in Exhibit D-11.
- Scientific and engineering batch services are forecast in Exhibit D-12.
- Industry specialty batch services are forecast in Exhibit D-13.
- Utility batch services are forecast in Exhibit D-14.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-6

FACILITIES MANAGEMENT - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1979–1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 51	$ 60	18%	$ 72	$ 87	$ 103	$ 120	$ 143	19%
PROCESS MANUFACTURING	34	39	15	48	55	65	74	86	17
TRANSPORTATION	25	30	20	34	38	42	46	50	11
UTILITIES	7	8	14	9	11	13	14	15	13
BANKING AND FINANCE	197	233	18	274	321	376	439	512	17
INSURANCE	362	411	13	465	528	598	676	767	13
MEDICAL	135	154	14	174	199	229	259	289	13
EDUCATION	17	20	18	23	27	32	37	43	17
RETAIL	5	6	18	8	9	10	12	14	18
WHOLESALE	33	38	14	42	48	55	62	69	13
FEDERAL GOVERNMENT	245	280	14	311	358	406	463	527	13
STATE & LOCAL GOVERNMENT	24	27	13	31	37	44	51	59	17
SERVICES*	–	–	–	–	–	–	–	–	–
OTHER	11	11	4	13	15	18	21	24	7
TOTAL	$1,146	$1,317	15%	$1,504	$1,733	$1,991	$2,274	$2,598	15%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $4 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-7

FACILITIES MANAGEMENT - SCIENTIFIC AND ENGINEERING FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 5	$ 5	10%	$ 6	$ 7	$ 8	$ 10	$ 12	19%
PROCESS MANUFACTURING	2	2	15	3	3	3	3	4	15
TRANSPORTATION *	–	–	–	–	–	–	–	–	–
UTILITIES	2	2	–	2	2	2	2	2	0
BANKING AND FINANCE *	–	–	–	–	–	–	–	–	–
INSURANCE *	–	–	–	–	–	–	–	–	–
MEDICAL *	–	–	–	–	–	–	–	–	–
EDUCATION *	–	–	–	–	–	–	–	–	–
RETAIL *	–	–	–	–	–	–	–	–	–
WHOLESALE *	–	–	–	–	–	–	–	–	–
FEDERAL GOVERNMENT	92	98	7	104	116	124	131	140	7
STATE & LOCAL GOVERNMENT *	–	–	–	–	–	–	–	–	–
SERVICES *	–	–	–	–	–	–	–	–	–
OTHER *	–	–	–	–	–	–	–	–	–
TOTAL	$ 101	$ 107	6%	$ 115	$ 128	$ 137	$ 146	$ 158	8%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $2 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-8

FACILITIES MANAGEMENT - INDUSTRY SPECIALTY FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 26	$ 31	19%	$ 37	$ 45	$ 55	$ 65	$ 78	20%
PROCESS MANUFACTURING	27	32	19	39	45	53	61	70	17
TRANSPORTATION	25	30	20	34	38	42	46	50	11
UTILITIES *	-	-	-	-	-	-	-	-	-
BANKING AND FINANCE	197	233	18	274	321	376	439	512	17
INSURANCE	362	411	13	465	528	598	676	767	13
MEDICAL	135	154	14	174	199	229	259	289	13
EDUCATION	17	20	18	23	27	32	37	43	17
RETAIL	5	6	18	8	9	10	12	14	18
WHOLESALE	29	33	14	37	42	48	54	61	13
FEDERAL GOVERNMENT*	-	-	-	-	-	-	-	-	-
STATE & LOCAL GOVERNMENT	5	6	20	8	11	15	20	26	34
SERVICES*	-	-	-	-	-	-	-	-	-
OTHER	7	7	3	8	9	10	11	12	11
TOTAL	$ 835	$ 963	15%	$1,107	$1,274	$1,468	$1,680	$1,922	15%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $5 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-9

FACILITIES MANAGEMENT - UTILITY FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 20	$ 24	20%	$ 29	$ 35	$ 40	$ 45	$ 53	17%
PROCESS MANUFACTURING	5	5	-	6	7	9	10	12	19
TRANSPORTATION*	-	-	-	-	-	-	-	-	-
UTILITIES	5	6	20	7	9	11	12	13	17
BANKING AND FINANCE*	-	-	-	-	-	-	-	-	-
INSURANCE*	-	-	-	-	-	-	-	-	-
MEDICAL*	-	-	-	-	-	-	-	-	-
EDUCATION*	-	-	-	-	-	-	-	-	-
RETAIL*	-	-	-	-	-	-	-	-	-
WHOLESALE	4	5	12	5	6	7	8	8	10
FEDERAL GOVERNMENT	153	182	19	207	242	282	332	387	16
STATE & LOCAL GOVERNMENT	19	21	11	23	26	29	31	33	9
SERVICES*	-	-	-	-	-	-	-	-	-
OTHER	4	4	8	5	6	8	10	12	11
TOTAL	$ 210	$ 247	18%	$ 282	$ 331	$ 386	$ 448	$ 518	16%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $5 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-10

BATCH SERVICES - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 301	$ 335	11%	$ 372	$ 410	$ 450	$ 496	$ 549	10%
PROCESS MANUFACTURING	127	137	8	147	158	169	181	193	7
TRANSPORTATION	41	45	10	49	54	59	63	67	8
UTILITIES	50	54	8	55	57	58	59	61	2
BANKING AND FINANCE	560	609	9	661	711	765	820	875	8
INSURANCE	83	89	7	96	102	109	118	127	7
MEDICAL	143	153	7	161	172	183	194	205	6
EDUCATION	35	39	10	41	46	50	52	53	6
RETAIL	160	171	7	183	197	211	226	243	7
WHOLESALE	217	232	7	253	276	300	328	360	9
FEDERAL GOVERNMENT	53	57	8	60	60	62	62	63	2
STATE & LOCAL GOVERNMENT	55	58	5	65	73	80	86	93	10
SERVICES	186	217	17	263	285	305	317	331	9
OTHER	173	175	2	198	220	241	269	308	12
TOTAL	$2,184	$2,371	9%	$2,604	$2,821	$3,042	$3,271	$3,528	8%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-11

BATCH SERVICES - GENERAL BUSINESS FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 170	$ 192	13%	$ 218	$ 247	$ 281	$ 321	$ 368	14%
PROCESS MANUFACTURING	52	56	7	61	67	73	79	86	17
TRANSPORTATION	16	18	15	20	22	24	26	28	9
UTILITIES	10	11	10	12	13	14	15	16	8
BANKING AND FINANCE	121	134	11	146	160	174	190	206	9
INSURANCE	20	22	6	23	24	25	27	29	6
MEDICAL	17	18	6	19	20	21	22	23	15
EDUCATION	8	9	10	9	10	11	12	13	8
RETAIL	65	68	5	80	93	107	122	138	15
WHOLESALE	107	113	6	130	149	172	198	229	15
FEDERAL GOVERNMENT	-	-	-	3	3	4	4	5	14
STATE & LOCAL GOVERNMENT	10	11	10	12	13	14	15	16	8
SERVICES	34	40	18	46	54	64	76	90	18
OTHER	58	58	0	63	70	79	90	112	14
TOTAL	$ 688	$ 750	9%	$ 842	$ 945	$1,063	$1,197	$1,359	13%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-12

BATCH SERVICES - SCIENTIFIC AND ENGINEERING FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 21	$ 21	-	$ 21	$ 21	$ 21	$ 21	$ 21	-
PROCESS MANUFACTURING	13	14	8	14	14	14	14	14	-
TRANSPORTATION	2	2	-	2	2	2	2	2	-
UTILITIES	18	18	-	18	18	18	18	18	-
BANKING AND FINANCE*	-	-	-	-	-	-	-	-	-
INSURANCE*	-	-	-	-	-	-	-	-	-
MEDICAL*	-	-	-	-	-	-	-	-	-
EDUCATION	2	2	-	2	2	2	2	2	-
RETAIL*	-	-	-	-	-	-	-	-	-
WHOLESALE	-	-	-	-	-	-	-	-	-
FEDERAL GOVERNMENT	8	9	13	9	9	10	10	10	2
STATE & LOCAL GOVERNMENT*	-	-	-	-	-	-	-	-	-
SERVICES	12	13	6	13	13	13	13	13	-
OTHER	17	17	-	17	18	18	18	18	1
TOTAL	$ 93	$ 96	3%	$ 96	$ 97	$ 98	$ 98	$ 98	-

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $2 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-13

BATCH SERVICES - INDUSTRY SPECIALTY FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 60	$ 69	15%	$ 78	$ 85	$ 90	$ 95	$ 100	8%
PROCESS MANUFACTURING	27	30	11	34	38	42	46	50	11
TRANSPORTATION	16	18	13	20	23	26	28	30	11
UTILITIES	8	10	20	10	11	11	11	12	4
BANKING AND FINANCE	432	468	8	507	542	581	619	656	7
INSURANCE	54	58	8	63	68	73	79	85	8
MEDICAL	120	128	7	135	145	155	165	175	6
EDUCATION	17	19	10	21	25	28	29	29	9
RETAIL	70	77	10	77	78	78	78	79	1
WHOLESALE	32	34	6	34	35	35	36	36	1
FEDERAL GOVERNMENT*	-	-	-	-	-	-	-	-	-
STATE & LOCAL GOVERNMENT	10	11	10	16	23	28	33	38	28
SERVICES	125	146	17	186	200	210	210	210	8
OTHER	85	86	1	104	117	129	145	162	14
TOTAL	$1,056	$1,154	9%	$1,285	$1,390	$1,486	$1,574	$1,662	8%

* BECAUSE THIS SECTOR IS ESTIMATED TO HAVE LESS THAN $5 MILLION IN 1984 REVENUES IN THIS TYPE OF SERVICE, IT HAS NOT BEEN INDIVIDUALLY FORECAST

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX D-14

BATCH SERVICES - UTILITY FORECAST BY INDUSTRY SECTOR, 1979-1984

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1979-1984								
	1978 ($M)	1979 ($M)	GROWTH 1978-1979 (%)	1980 ($M)	1981 ($M)	1982 ($M)	1983 ($M)	1984 ($M)	AAGR 1979-1984 (%)
DISCRETE MANUFACTURING	$ 50	$ 53	6%	$ 55	$ 57	$ 58	$ 59	$ 60	3%
PROCESS MANUFACTURING	35	37	6	38	39	40	42	43	3
TRANSPORTATION	7	7	-	7	7	7	7	7	-
UTILITIES	14	15	7	15	15	15	15	15	-
BANKING AND FINANCE	7	7	7	8	9	10	11	13	11
INSURANCE	9	9	5	10	10	11	12	13	6
MEDICAL	6	7	9	7	7	7	7	7	-
EDUCATION	8	9	11	9	9	9	9	9	-
RETAIL	25	26	4	26	26	26	26	26	-
WHOLESALE	78	85	9	89	92	93	94	95	2
FEDERAL GOVERNMENT	45	48	7	48	48	48	48	48	-
STATE & LOCAL GOVERNMENT	35	36	3	37	37	38	38	39	2
SERVICES	15	18	20	18	18	18	18	18	-
OTHER	13	14	8	14	15	15	16	16	3
TOTAL	$ 347	$ 371	7%	$ 381	$ 389	$ 395	$ 402	$ 409	2%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E: RESPONDENT HARDWARE INSTALLED AND ON ORDER

APPENDIX E: RESPONDENT HARDWARE INSTALLED AND ON ORDER

- This appendix details the INPUT user panel mainframe hardware installed base and on order position of respondents. The data is separated by industry in Exhibits E-1 through E-9.

- Installed mainframe position of respondents is summarized in Exhibit E-10.

  - IBM controls almost 50% of the respondents' installed mainframe base.

- Mainframes on order by respondents are shown in Exhibit E-11.

  - IBM accounts for nearly 90% of all mainframe hardware on order.

  - IBM 4300s represent over 40% of all mainframe hardware on order.

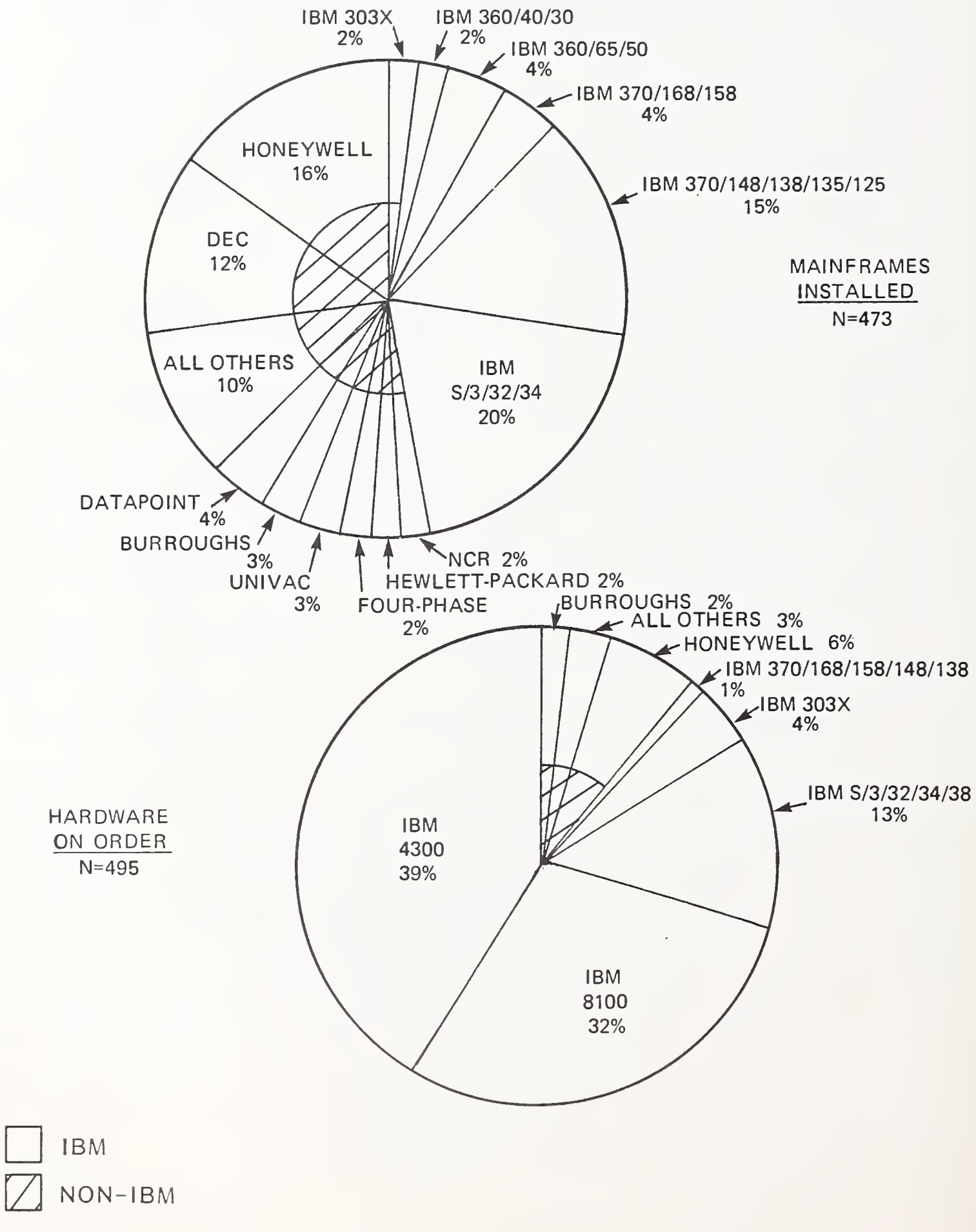
  - IBM 8100s represent 30% of all mainframe hardware on order.

- It should be pointed out that hardware on order does not necessarily translate into hardware installed. Many companies place orders for new hardware systems, but never take delivery of those systems. However, the data does show the large number of orders that IBM received for its Series 8100 and 4300.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

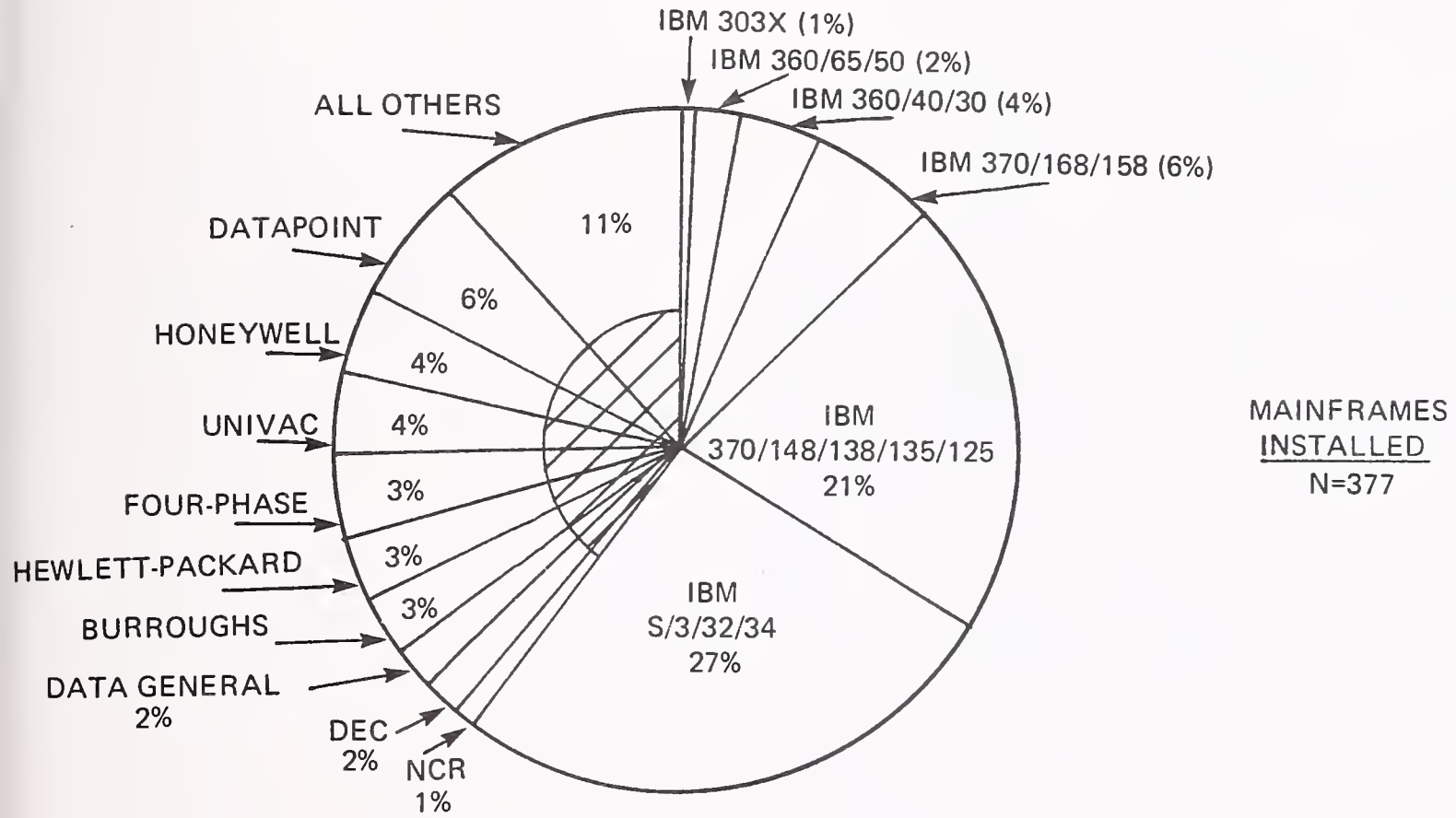
APPENDIX E-1

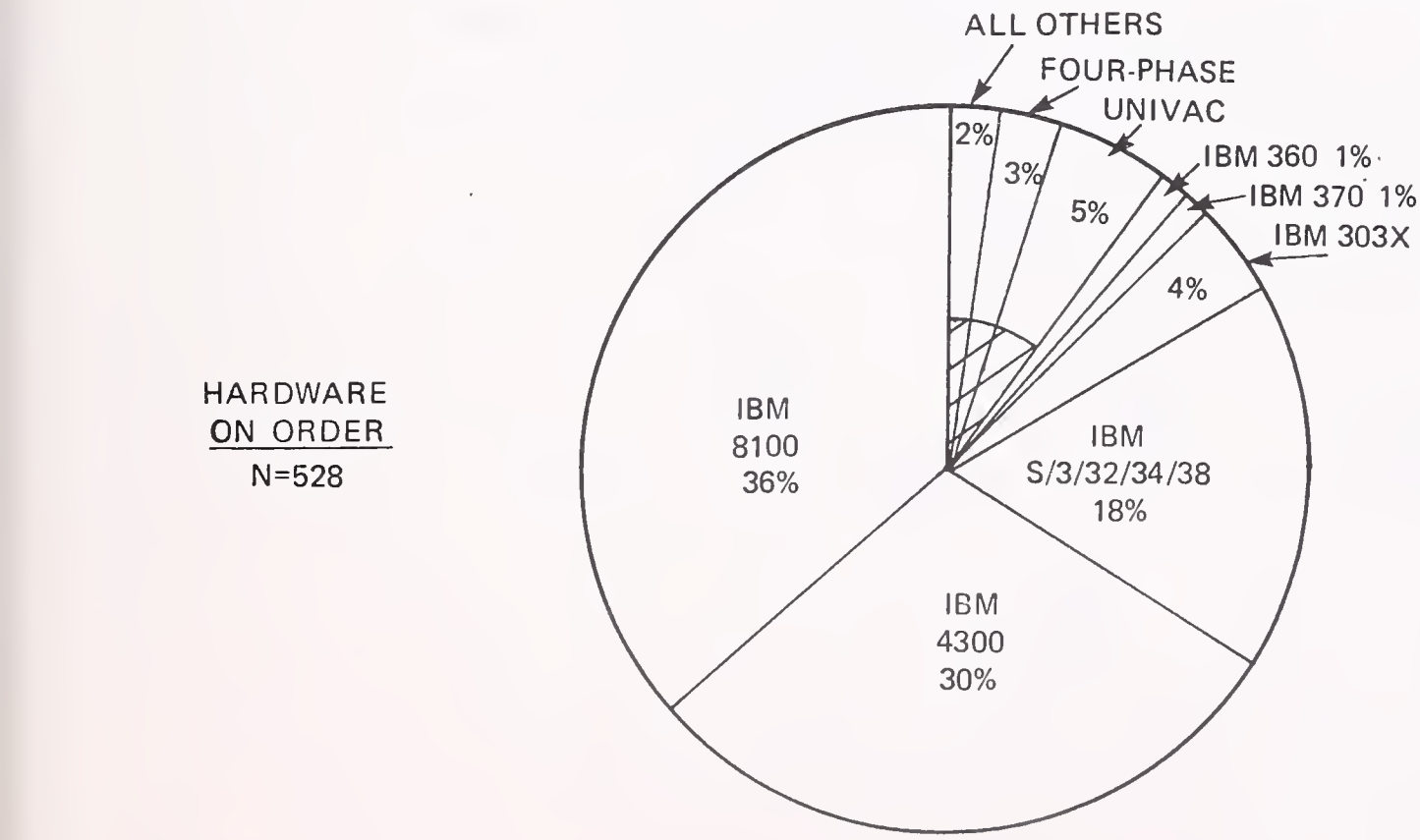
HARDWARE INSTALLED AND ON ORDER IN THE DISCRETE MANUFACTURING SECTOR



© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

HARDWARE INSTALLED AND ON ORDER IN THE PROCESS MANUFACTURING SECTOR





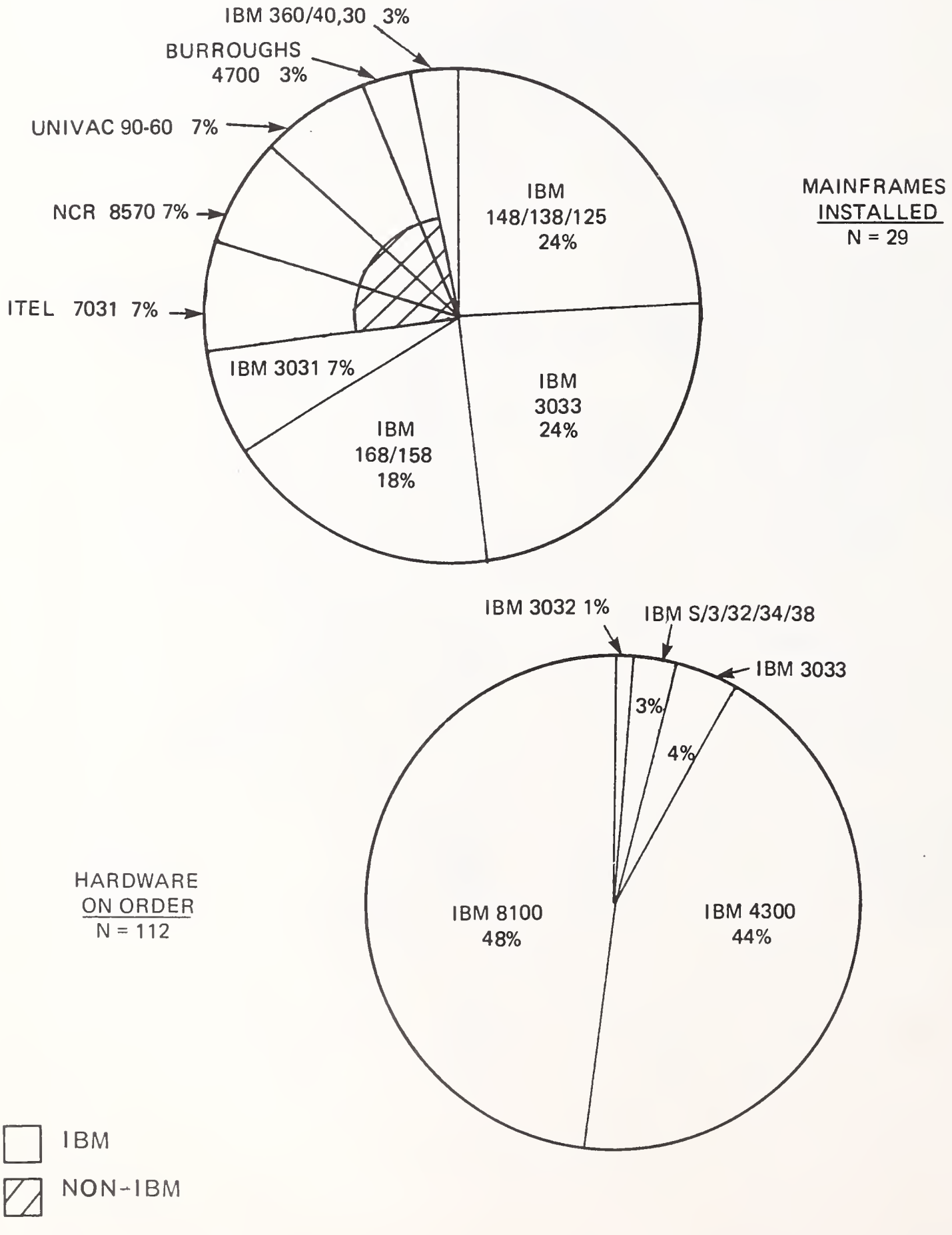
IBM

NON-IBM

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-3

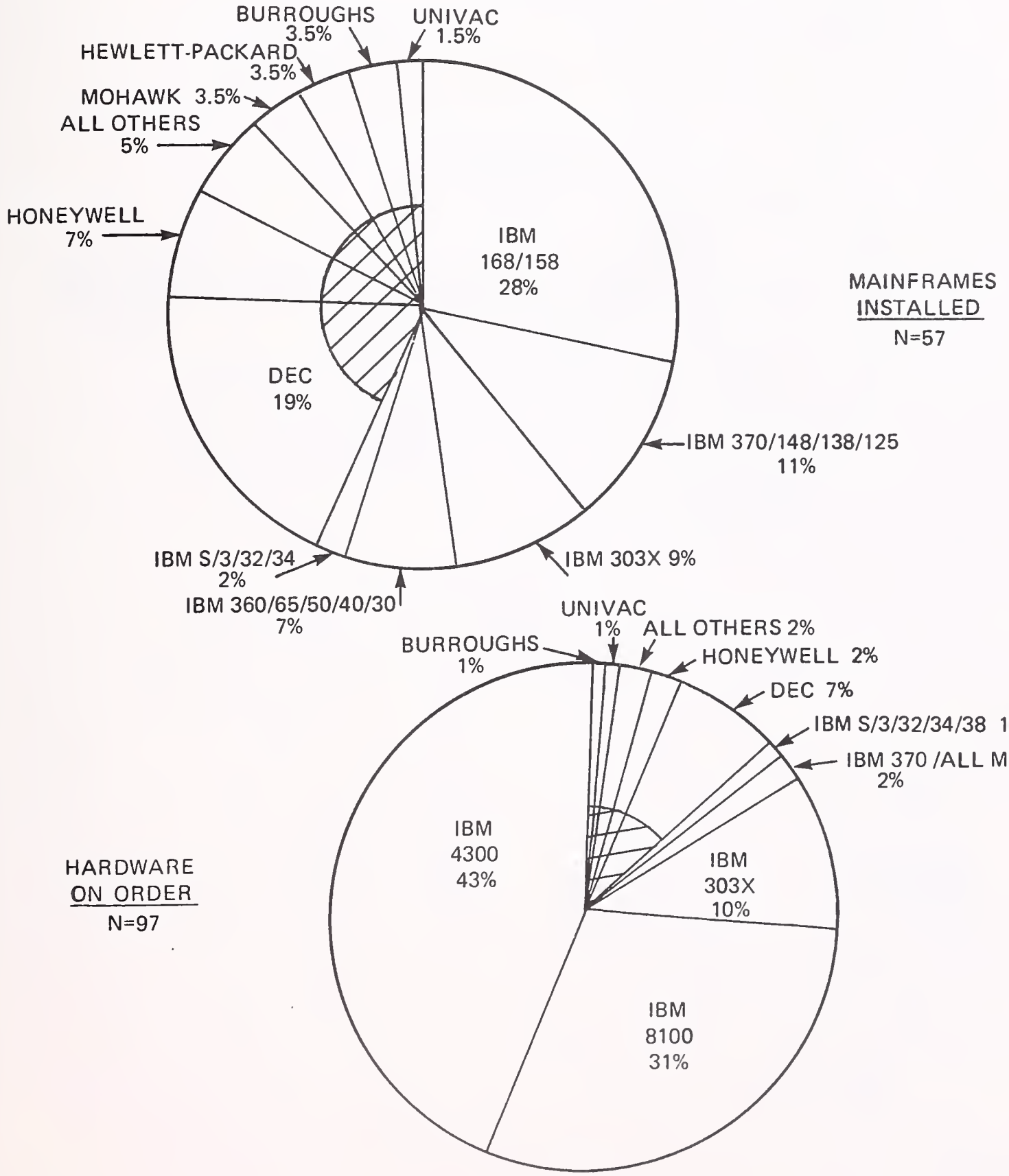
HARDWARE INSTALLED AND ON ORDER IN THE TRANSPORTATION SECTOR



© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-4

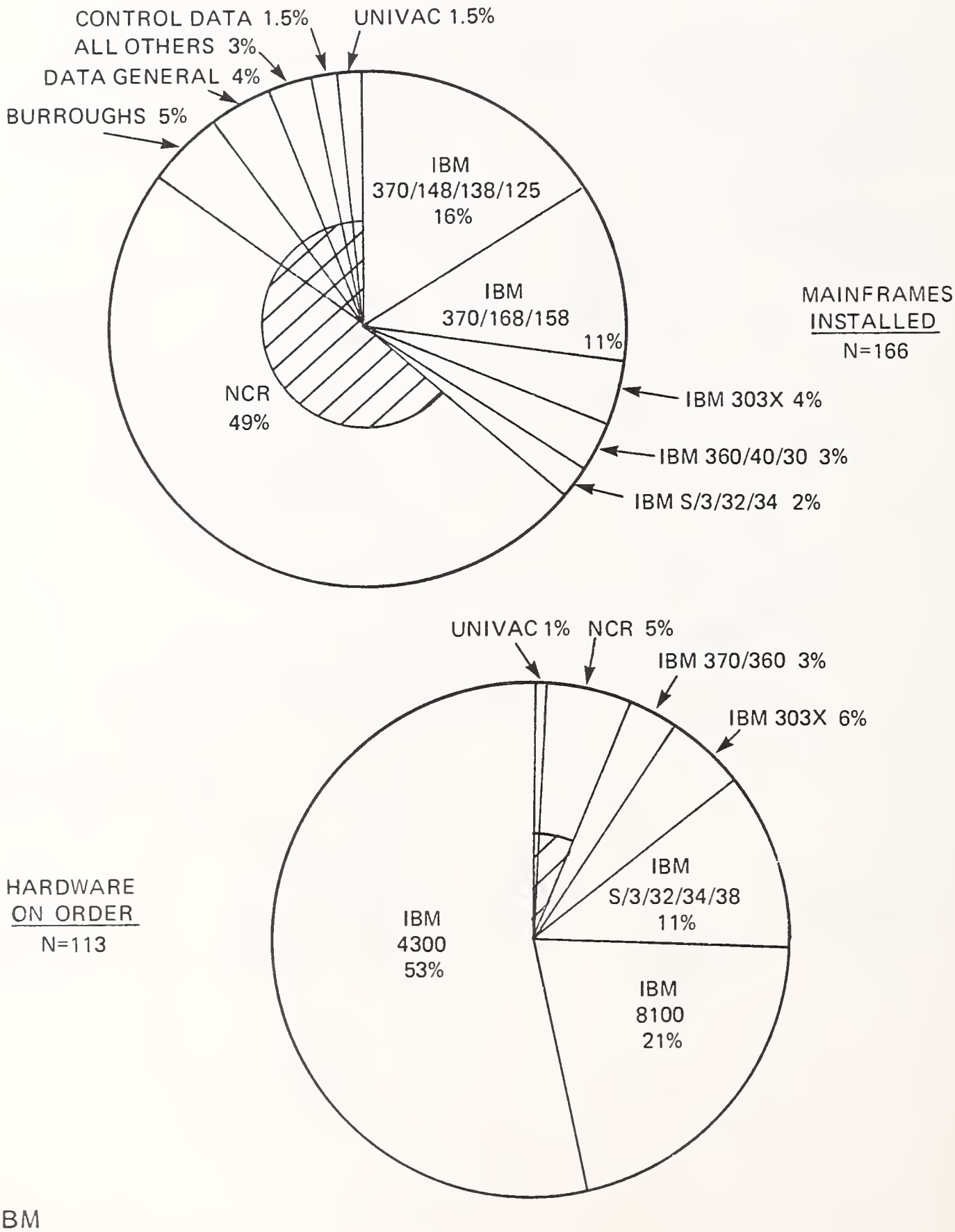
HARDWARE INSTALLED AND ON ORDER IN THE UTILITY SECTOR



© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-5

HARDWARE INSTALLED AND ON ORDER IN THE BANKING AND FINANCE SECTOR

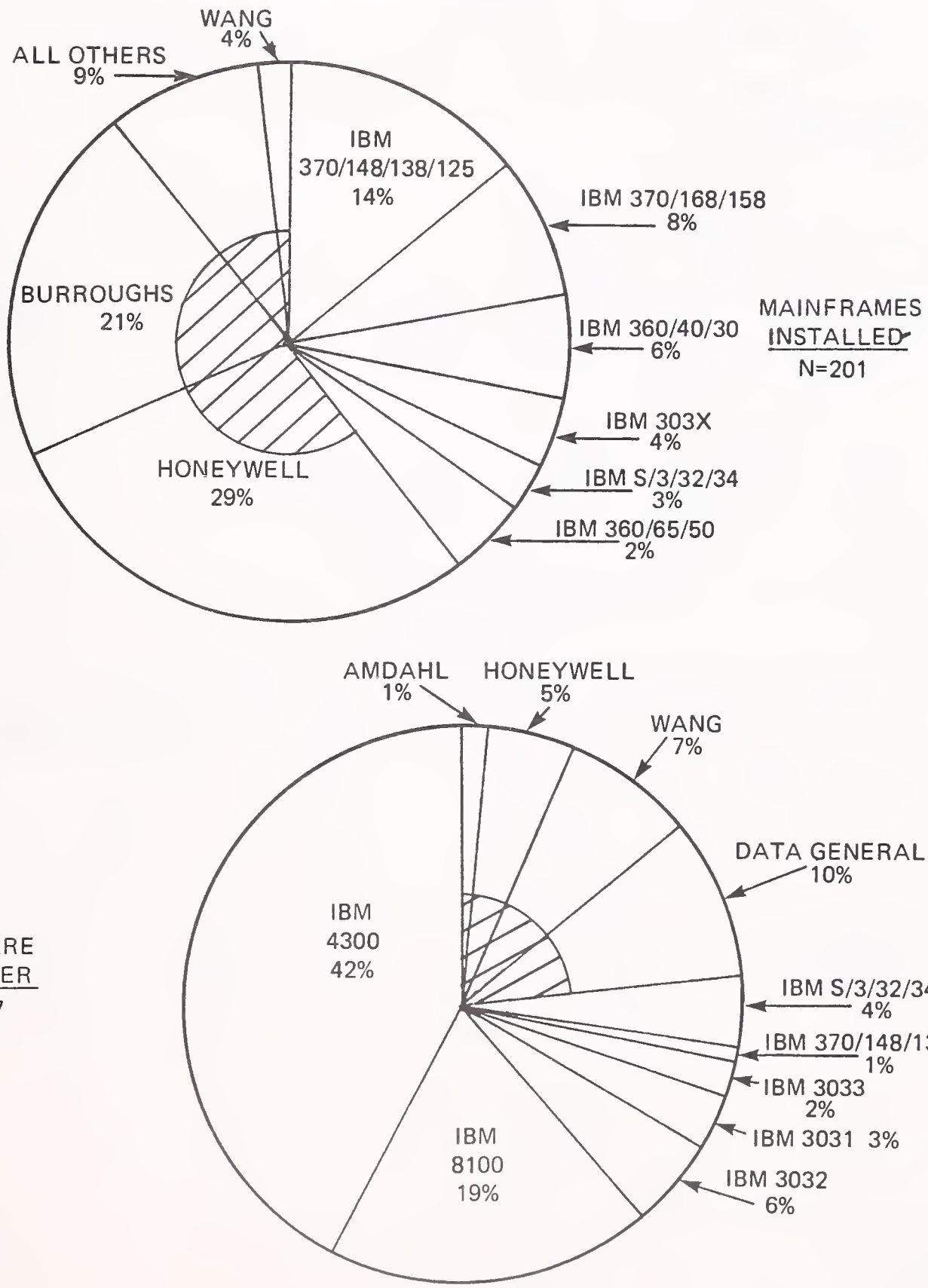


SOURCE: INPUT EDP USER PANEL, 1979

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-6

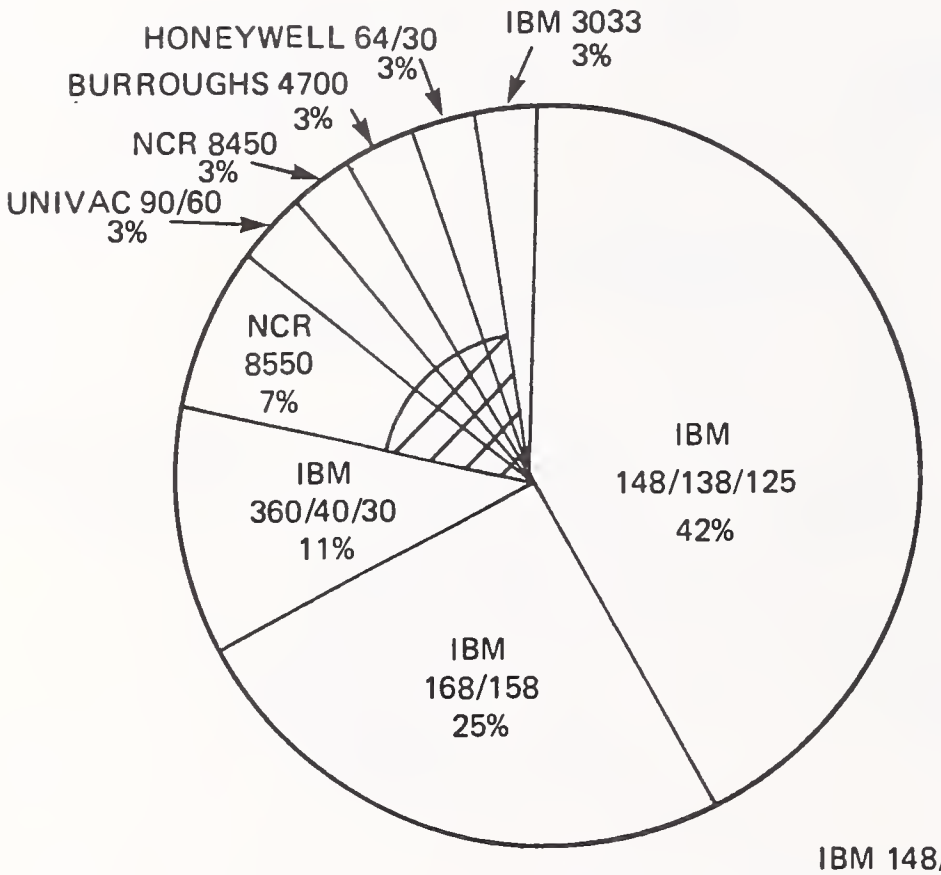
HARDWARE INSTALLED AND ON ORDER IN THE INSURANCE SECTOR



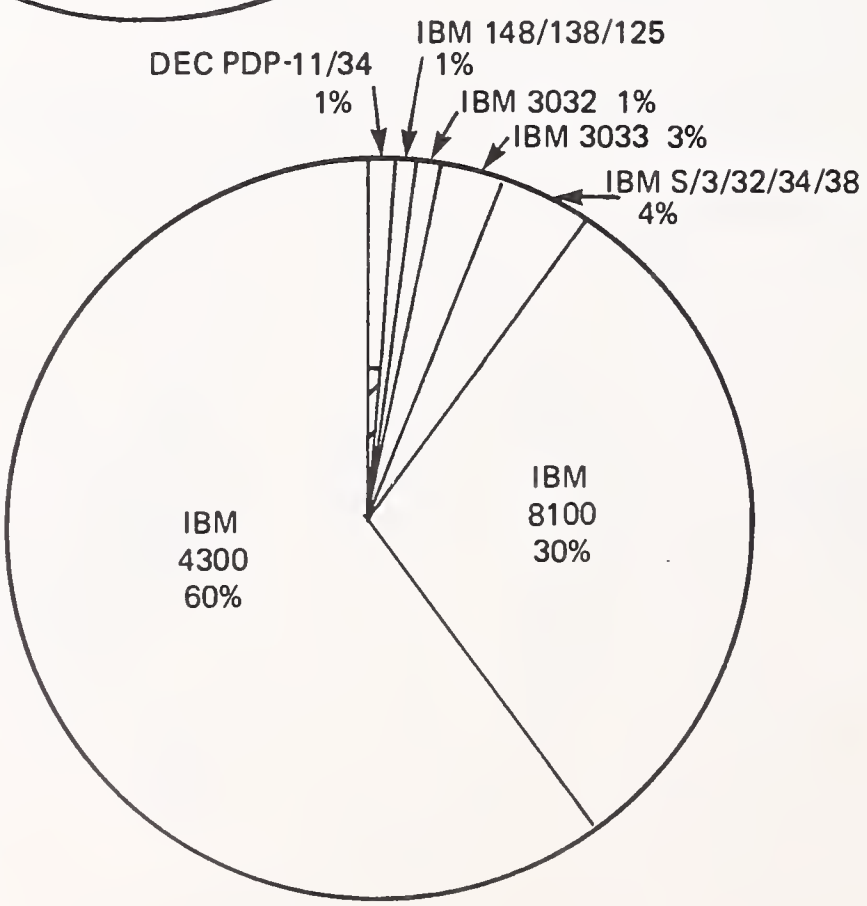
© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-7

HARDWARE INSTALLED AND ON ORDER IN THE RETAIL SECTOR



MAINFRAMES INSTALLED
N=29



HARDWARE ON ORDER
N=97

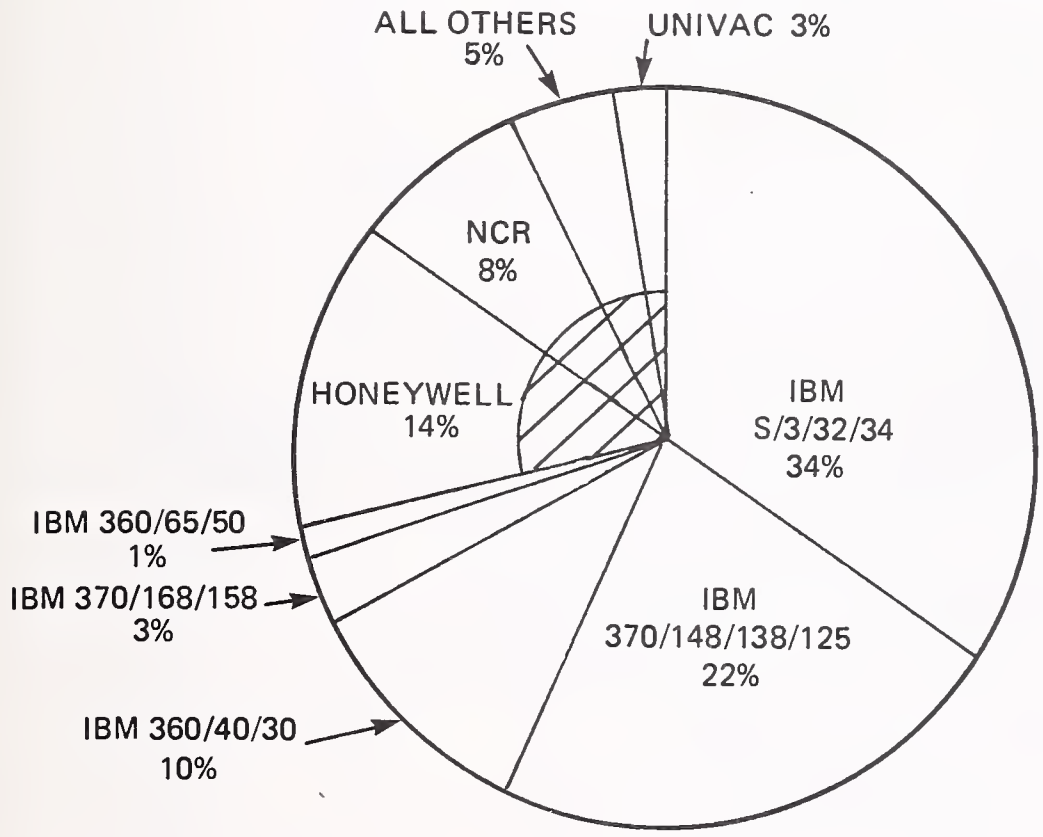
IBM

NON-IBM

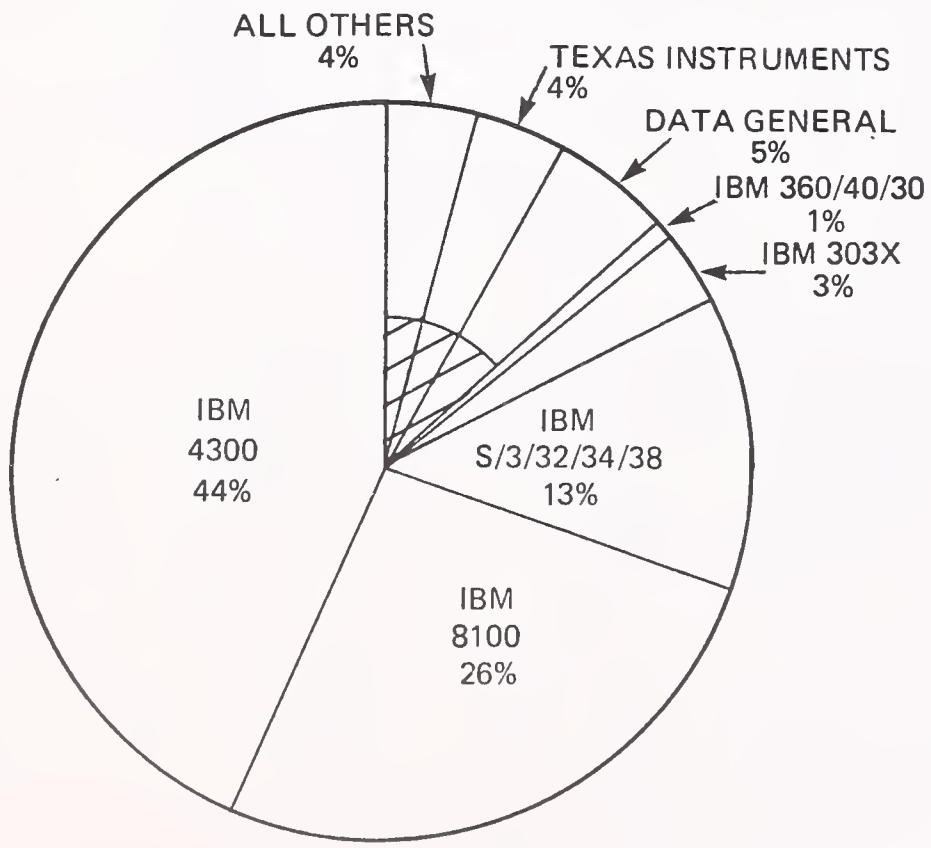
© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-8

HARDWARE INSTALLED AND ON ORDER IN THE WHOLESALE SECTOR



MAINFRAMES
INSTALLED
N=87



HARDWARE
ON ORDER
N=133

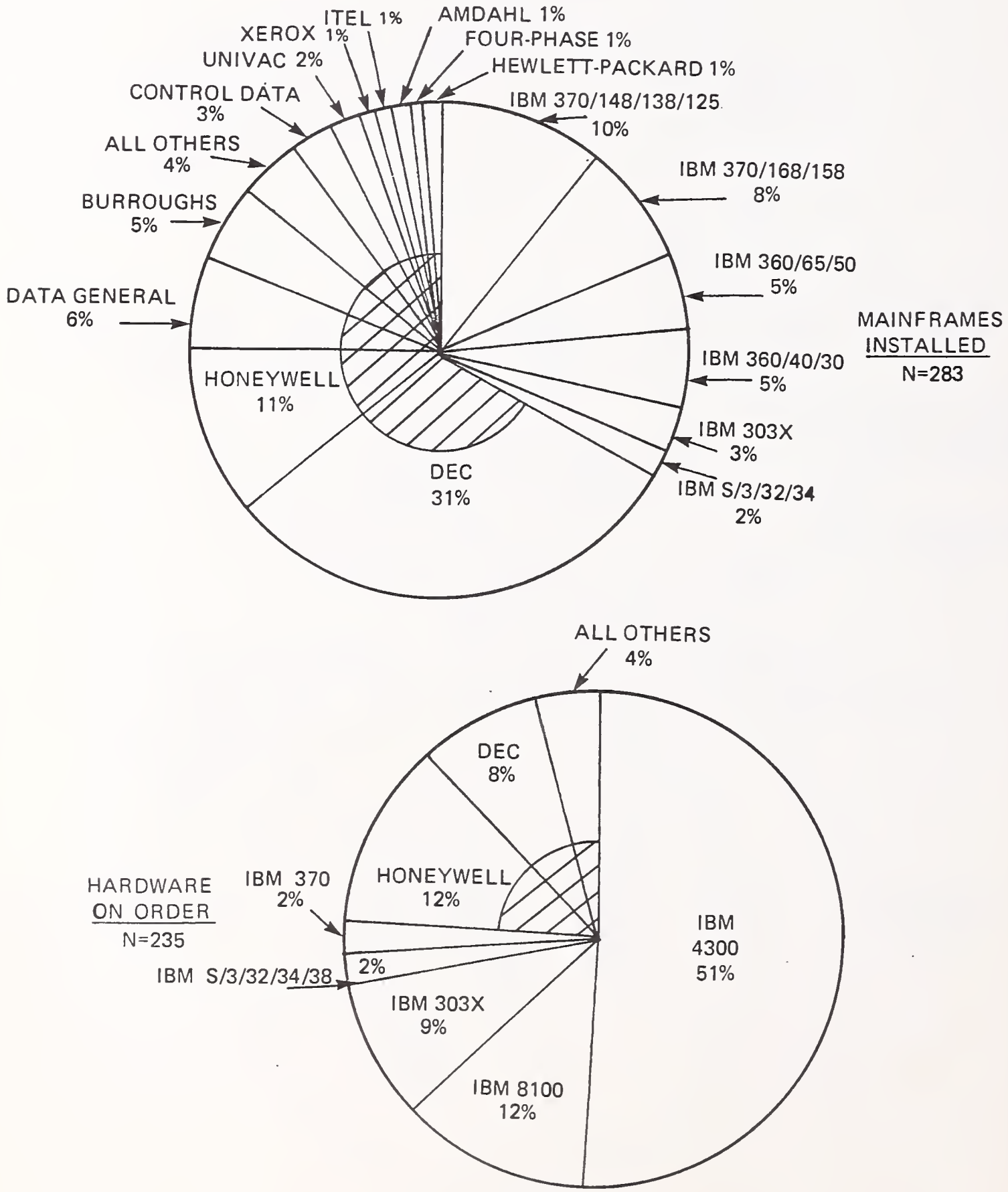
IBM

NON-IBM

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-9

HARDWARE INSTALLED AND ON ORDER IN THE EDUCATION, MEDICAL, SERVICES, AND OTHER INDUSTRIES SECTOR



© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX E-10

MAINFRAME HARDWARE INSTALLED BY RESPONDENTS

INDUSTRY	NUMBER OF MAINFRAME COMPUTERS INSTALLED									
	LARGE IBM	SMALL IBM	TOTAL IBM	HONEY-WELL	BUR-ROUGHS	UNIVAC	NCR	OTHER	TOTAL	PERCENT IBM
DISCRETE MANUFACTURING	128	95	223	76	14	14	9	137	473	47%
PROCESS MANUFACTURING	128	102	230	15	11	15	4	102	377	61
TRANSPORTATION	22	0	22	0	1	2	2	2	29	76
UTILITIES	31	1	32	4	2	1	0	18	57	56
BANKING & FINANCE	56	3	59	0	8	2	81	16	166	36
INSURANCE	68	4	72	58	42	0	0	29	201	36
RETAIL	24	0	24	1	1	1	2	0	29	83
WHOLESALE	31	30	61	12	0	3	7	4	87	70
EDUCATION, MEDICAL SERVICES & OTHER	88	6	94	31	14	6	0	138	283	33
TOTAL	576	241	817	197	93	44	105	446	1,702	48%
PERCENT	34%	14%	48%	12%	5%	3%	6%	26%	100%	48%

APPENDIX E-11

MAINFRAME HARDWARE ON ORDER BY RESPONDENTS

INDUSTRY	NUMBER OF MAINFRAME COMPUTERS ON ORDER						PERCENT IBM
	LARGE IBM	SMALL IBM	IBM 8100	IBM 4300	NON-IBM	TOTAL	
DISCRETE MANUFACTURING	25	64	158	193	55	495	89%
PROCESS MANUFACTURING	95	32	190	158	53	528	90
TRANSPORTATION	5	3	54	50	0	112	100
UTILITIES	12	1	30	42	12	97	88
BANKING AND FINANCE	10	12	24	60	7	113	94
INSURANCE	18	6	28	62	33	147	78
RETAIL	5	4	29	58	1	97	99
WHOLESALE	5	17	35	59	17	133	87
EDUCATION, MEDICAL, SERVICES AND OTHER	26	5	28	120	56	235	76
TOTAL	201	144	576	802	234	1,957	88%
PERCENT	10%	7%	30%	41%	12%	100%	

APPENDIX F: RELATED INPUT REPORTS

APPENDIX F: RELATED INPUT REPORTS

1977-1979 MARKET ANALYSIS SERVICE (MAS)

IMPACT AND INDUSTRY REPORTS

ANNUAL REPORT

	Year
• Computer Services Industry 1978 Annual Report	1978
• Computer Services Industry 1977 Annual Report	1977

IMPACT REPORTS

• Sales And Sales Support Training	1979
• Opportunities in Marketing Systems Software Products	1979
• Opportunities In Education Services	1979
• Turnkey Systems Markets	1979
• Office Of The Future: Opportunities For Service Companies	1979
• Distributed Data Processing Systems: Applications, Performance and Architecture	1978
• Trends In Service And Software Pricing	1978
• Acquisition Strategies For Computer Services Companies	1978
• Opportunities In User Site Hardware Services	1978
• Data Base Management Systems Software Markets	1978

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

•	Computer Services Markets In Europe	1978
•	Financial Management And Planning Services And Software Markets	1978
•	Impact Of Marketing Compensation Plans In The Computer Services Industry	1977
•	Plug Compatible Mainframes: The New Hardware Economics	1977
•	Small Business Computers: Their Impact On Processing Services	1977
•	Remote Computing Services Markets Based On Data Base Management Systems	1977

VERTICAL INDUSTRY REPORTS

•	Computer Services Markets In Banking and Finance	1979
•	Computer Services Markets In Insurance Companies	1979
•	Computer Services Markets In Government Funded Health Insurance	1979
•	Computer Services Markets In Hospitals	1978
•	Computer Services Markets In Correspondent Banking	1977
•	Computer Services Markets In The Discrete Manufacturing Industry	1977
•	Computer Service Markets In The Wholesale Industry	1977
•	Computer Services In Federal Government Energy Programs	1977

MULTICLIENT STUDIES

•	The Future Of Plug Compatible Computer Products	1979
•	Value Added Networks Services	1978
•	Maintenance Requirements For The Information Processing Industry	1978

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

OTHER INPUT SUBSCRIPTION PROGRAMS

- Company Analysis And Monitoring Program For The Computer Services Industry
- Field Service Planning Information Program
- Planning Service For Computer And Communications Users
- Residual Value Forecasting Service
- Small Establishment Markets For Equipment And Services
- Vendor Watch Service

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

APPENDIX G: USER PANEL RESPONDENT PROFILE AND QUESTIONNAIRE

APPENDIX G

USER PANEL RESPONDENT PROFILE AND QUESTIONNAIRE

INDUSTRY SECTOR	NUMBER OF RESPONDENTS	PERCENT
DISCRETE MANUFACTURING	107	24%
PROCESS MANUFACTURING	96	22
TRANSPORTATION	12	3
UTILITIES	24	5
BANKING AND FINANCE	47	11
INSURANCE	60	13
RETAIL	20	5
WHOLESALE	20	5
EDUCATION, MEDICAL, AND OTHERS	54	12
TOTAL	440	100%

© 1979 by INPUT, Palo Alto, CA 94303. Reproduction Prohibited.

EDP USER QUESTIONNAIRE

CODE NO. U P 7 9 | | | | |

GENERAL INFORMATION

Primary business _____ Company annual sales, revenues, or assets $_____

Total no. of employees _____ No. of EDP employees _____

If size of organization cannot be specified by any of these measures, please indicate size by other measure:

_____

Are the above statistics for: ☐ Total corporation? ☐ Division or subsidiary?

EDP PLANS

1. What major objectives do you have for EDP?

   In 1979 _____

   _____

   In 1980 _____

   _____

   In 1981 _____

   _____

2. Do your plans include contingencies for a recession? in 1979 ☐Yes ☐No or 1980 ☐Yes ☐No
3. If a recession occurs will you reduce expenditures? ☐Yes ☐No

   If so, in what areas? _____ Percent reduction _____
4. What are the most significant EDP problems in your organization which you would like to see resolved?

   _____

   _____

   _____
5. In order of priority, what new applications will you develop or require within the next 2 years?

   1. _____

   2. _____

   3. _____
6. What do you consider to be the most significant event in the computer/communication industry during the past 12 months? _____
7. Please indicate any studies you would like conducted regarding EDP users. _____

   _____

   _____

EXPENDITURES

A. Overall EDP Budget

1. What is your total annual EDP budget? (If you can't give an absolute figure, please list as a percentage of total company sales, revenues or assets.) A) $_____ or B) _____%
2. Please indicate percent changes in your EDP budget (increase/decrease) from:

   1978 to 1979 _____% 1979 to 1980 _____%
3. Please indicate in percentages how your EDP budget will be spent in 1979 and anticipated changes in 1980 and 1981, if known.

CATEGORY	% OF TOTAL EDP BUDGET		
	1979	1980	1981
A) Personnel	_____%	_____%	_____%
B) Central computer and related	_____%	_____%	_____%
C) Mini/micro computers/programmable terminals	_____%	_____%	_____%
D) Non-programmable terminals	_____%	_____%	_____%
E) Communications hardware and services	_____%	_____%	_____%
F) Software (purchase/lease)	_____%	_____%	_____%
G) Processing services (outside)	_____%	_____%	_____%
H) Supplies & Other_____	_____%	_____%	_____%

INPUT
2471 EAST BAYSHORE BLVD., SUITE 600, PALO ALTO, CA 94303 (415) 493-1600

CODE NO. U P 7 9 _ _ _ _

B. Outside Computer Services and Software Expenditures

1. If you purchase outside computer services or software, please complete the following chart.

TYPE OF SERVICE	1978 EXPENDITURES	ANTICIPATED 1979 EXPENDITURES	ANTICIPATED % CHANGE 1979 TO 1980	MAJOR VENDOR(S)
PROCESSING SERVICES				
Interactive timesharing	$_____	$_____	_____%	_____
Remote batch	$_____	$_____	_____%	_____
Batch	$_____	$_____	_____%	_____
Input/Output (COM, data entry, etc.)	$_____	$_____	_____%	_____
SOFTWARE PRODUCTS				
Systems software (incl. DBMS)	$_____	$_____	_____%	_____
Applications software	$_____	$_____	_____%	_____
PROFESSIONAL SERVICES				
Contract programming and design	$_____	$_____	_____%	_____
EDP consulting	$_____	$_____	_____%	_____
Education	$_____	$_____	_____%	_____
Other	$_____	$_____	_____%	_____
FACILITIES MANAGEMENT	$_____	$_____	_____%	_____
MAINTENANCE				
Hardware	$_____	$_____	_____%	_____
Software	$_____	$_____	_____%	_____
Total expenditures for outside services:	$_____	$_____	_____%	

2. Does your company purchase outside computer services that are not under the control of the EDP organization? ☐Yes ☐No If yes, what were the approximate annual expenditures for these services in 1978?_____

3. Who purchases them? Finance_____% R & D/Engr._____% Corporate_____%
Operations/Mfg._____% Personnel_____% Mkt./Sales_____%

4. What percent increase/decrease do you expect in the purchase of these types of outside services between 1978 & 1979_____%; 1979 & 1980_____%

5. If you do not use outside services or software now, what EDP functions or application processing would you consider purchasing?_____

6. Have you replaced or considered replacing any outside data processing service with an in-house minicomputer or microcomputer?
A) ☐ Yes, we have replaced. B) ☐ We have considered replacement.
C) ☐ No, replacement has not occurred nor have we considered it.
Reason:_____

7. Are you looking for application software package to assist in implementing new requirements?
☐ Yes ☐ No Application areas?_____
If no, why not?_____

EDP HARDWARE

1. If IBM, indicate the number of systems installed and/or on order for each of the following categories.

CLASS	INSTALLED	ON ORDER	CLASS	INSTALLED	ON ORDER
3033	_____	_____	4300	_____	_____
3032	_____	_____	370/148 or 138 or 125	_____	_____
3031	_____	_____	360/40 or 30	_____	_____
370/168 or 158	_____	_____	8100	_____	_____
360/65 or 50	_____	_____	System 3, 32, 34, 38	_____	_____

2. If other than IBM, please specify.

VENDOR	MODEL	NO. INSTALLED	NO. ON ORDER	NO. LOCATED: AT HQ.	NO. LOCATED: AT REMOTE SITES
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

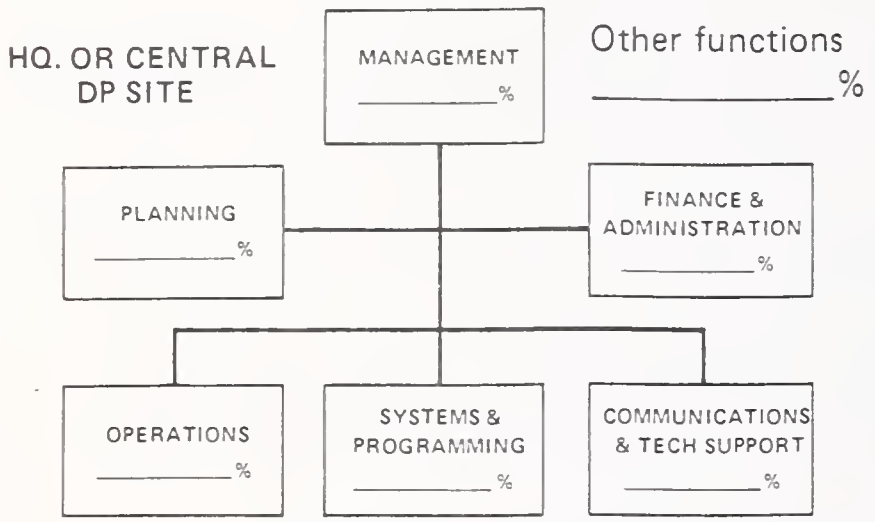
3. Please indicate the number of devices installed.

HAVE YOU INSTALLED:	NONE, NO PLANS	NONE, BUT PLANNED	INSTALLED 1–10	11–100	100+	PROJECTED GROWTH 1979–1980
A) Minicomputers or small business computers	☐	☐	☐	☐	☐	_____%
B) Microcomputers or personal computers	☐	☐	☐	☐	☐	_____%
C) Intelligent terminals	☐	☐	☐	☐	☐	_____%
D) Non-intelligent terminals	☐	☐	☐	☐	☐	_____%

4. How does the EDP group plan/control the acquisition and use of categories 3a and 3b? _____

EDP ORGANIZATION ISSUES

1. Please indicate in the organization chart below the number or percent of EDP employees within each organizational element.



Total number of EDP employees _____
including _____ at HQ.
and _____ at divisions.
If EDP is decentralized, what functions are performed by HQ. EDP? _____

2. How many of your branch or division locations are now using or will use distributed data processing (DDP)? How many are now or will be on a voice or data leased line corporate network? How many are or will be using a value added (VAN) corporate network (Telenet, Tymnet, etc.)? ☐ Not applicable, no branches or divisions.

NO. OF EMPLOYEES IN BRANCH/DIVISION	HOW MANY LOCATIONS ARE OF THIS SIZE?	1979 WHAT PERCENT NOW USE DDP	LEASED LINE	VAN	1983 WHAT PERCENT WILL USE DDP	LEASED LINE	VAN
1000+	_____	_____%	_____%	_____%	_____%	_____%	_____%
500–999	_____	_____%	_____%	_____%	_____%	_____%	_____%
100–499	_____	_____%	_____%	_____%	_____%	_____%	_____%
20–99	_____	_____%	_____%	_____%	_____%	_____%	_____%
1–20	_____	_____%	_____%	_____%	_____%	_____%	_____%

3. For the categories below, how are data processing functions shared between the corporate office and division/branch locations? ☐ Not applicable, no branches or divisions.

IF DATA PROCESSING IS FOR USE BY:	WHERE IS IT PERFORMED? TOTALLY AT CORPORATE	SHARED BY CORP. & BRANCH	TOTALLY AT BRANCH
CORPORATE HEADQUARTERS	☐	☐	☐
BRANCHES/DIVISIONS WITH:			
1000+ employees	☐	☐	☐
500–999 employees	☐	☐	☐
100–499 employees	☐	☐	☐
20–99 employees	☐	☐	☐
1–19 employees	☐	☐	☐

CODE NO. U P 7 9 | | | |

UTILIZATION ISSUES

1. What percent of your computer resources are used for:
   - A) Production Runs _____%
   - B) New applications development _____%
   - C) Maintenance of existing programs _____%
   - D) Other (Specify)_____ _____%

   100 %

2. What percent of your application programmers are assigned to:
   - A) Development of new programs _____%
   - B) Maintenance of existing programs _____%
   - C) Other (Specify)_____ _____%

   100 %

3. What measures are you taking to reduce the time and costs associated with new applications development?

_____

_____

TRAINING ISSUES

1. Excluding university level courses, please indicate your 1978 annual costs for training.

TYPE COURSE	IN-HOUSE EXPENDITURES	OUTSIDE SERVICE EXPENDITURES	PERCENT OF STAFF ATTENDING
Technical	$	$	%
Management	$	$	%

2. What percent change (increase/decrease) do you expect in your training budget?
   1979 to 1980_____% 1979 to 1983_____%
3. Which vendors do you use for technical and management training?

TECHNICAL TRAINING VENDORS		MANAGEMENT TRAINING VENDORS	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. What types of outside training does your organization need that is not currently available?_____

_____

_____

OFFICE OF THE FUTURE ISSUES

1. Please identify your involvement in the following areas relative to the office of the future.

TYPE	INVOLVEMENT (Check all that apply)
Electronic Mail	☐ Company using it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ EDP responsible for it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know
Word Processing	☐ Company using it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ EDP responsible for it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ If definite plans or now using, is it ☐ standalone ☐ clustered mini ☐ software on mainframe
Telecopier or Facsimile	☐ Company using it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ EDP responsible for it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know
Data Communications	☐ Company using it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ EDP responsible for it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ If definite plans or now using, is it ☐ dial up ☐ WATS ☐ dedicated ☐ Telex/TWX
Long distance Voice Lines	☐ Company using it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ EDP responsible for it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ If definite plans or now using, is it ☐ dial up ☐ WATS ☐ dedicated ☐ MCI, SPC, Other
Graphics on CRT Terminals	☐ Company using it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know ☐ EDP responsible for it ☐ now ☐ in 19_____ ☐ not now, no plans ☐ don't know